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NUCLEAR SCIENCE ABSTRACTS

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The printing of this publication has been approved by The Director of the Bureau of the Budget, June 15, 1956.

INTRODUCTION

Nuclear Science Abstracts (NSA) is issued twice a month by the Atomic Energy Commission (AEC). It is intended primarily to serve scientists and engineers working within the Atomic Energy Project, by abstracting as completely and as promptly as possible the literature of nuclear science and engineering. It covers not only unclassified and declassified research reports of the AEC and its contractors, but also material in its field of interest which appears in unpublished research reports of government agencies, universities, and industrial research establishments, and in the technical and scientific journals.

DECLASSIFICATION

The issuance of these abstracts does not constitute authority for declassification of any reports.

INDEXES

Nuclear Science Abstracts is indexed by personal and corporate author, by subject, and by report number. Annual index issues are prepared for each volume. A cumulated index to Vols. 1–4 was issued as Vol. 4, No. 24B, Dec. 30, 1950, covering authors, subjects, nuclides, and report numbers. The 24th number of Vols. 5, 6, and 7 contains indexes covering the individual volumes, as well as a cumulated Numerical Index of Reports covering *Abstracts of Declassified Documents (ADD)*, Vols. 1 and 2, and the previously issued *NSA* volumes. Issue 24A of Vol. 8 contains Author and Subject Indexes and a Numerical Index of Reports for items abstracted in that volume. This issue contains Personal Author, Corporate Author, and Subject Indexes and a Numerical Index of Reports for items Abstracted in Vol. 9. A separate publication (TID-4000, *Cumulated List of Available Unclassified AEC Reports*) contains a Numerical Index of Reports cumulated through Vol. 8 of *NSA*.

Each issue of Vol. 10 (1956) contains an Author Index and a Numerical Index of Reports for abstracts in that issue as well as new availability information on reports abstracted previously. Subject and Author indexes, as well as a cumulation of the Numerical Index of Reports, are issued as a supplement to the 12th issue. The 24th issue will be the annual index for the volume.

Nuclear Science Abstracts carries in issues 6B, 12B, 18B, and 24B lists of New Nuclear Data in which experimental results are displayed in tabular form and arranged by element and isotope, with each entry including a reference. The listing in No. 24B is the annual cumulation. The lists of New Nuclear Data are compiled by the Nuclear Data Group of the National Research Council, Washington 25, D. C. The New Nuclear Data items are also supplied by this group on 3×5 in. cards for $20.00 a year domestic and about $30.00 a year foreign (air mail postage included).

AVAILABILITY

Nuclear Science Abstracts is available in single copies (regular issues are 25 cents each; index issues are priced according to size; plus postage on all issues for foreign orders) or by subscription ($6.00 a year domestic; $8.00 a year foreign) from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Change of address notices for sale subscriptions should be sent to the above address.

Nuclear Science Abstracts is also available on an exchange basis to universities, research institutions, industrial firms, and publishers of scientific information. The AEC invites inquiries from such organizations interested in exchanging publications.

Inquiries about exchanges and other official distribution, as well as change of address notices for official and exchange recipients, should be sent to the Technical Information Service Extension, U. S. Atomic Energy Commission, P. O. Box 62, Oak Ridge, Tenn.

RESEARCH AND DEVELOPMENT REPORTS

In general, only requesters associated with the U. S. Atomic Energy Program, and with other government agencies, can obtain reports from the AEC or its contractors. Requesters not officially sponsored should not seek to obtain reports from the Commission or its contractors. Such requesters should obtain reports as described below.

How to Locate Reports. The Numerical Index of Reports at the back of each issue of *NSA* lists by number each AEC report abstracted in that issue and indicates how each may be obtained (e.g., by purchase from the Office of Technical Services; from an AEC depository library, etc.). The Numerical Index also contains any more recent information about AEC reports previously abstracted, noting particularly where these have been published. For details, consult the introductory material in the Numerical Index of Reports.

For information concerning the availability of USAEC reports see the paragraph under INDEXES.

Reports for Sale. The Office of Technical Services, Department of Commerce, Washington 25, D. C. is the sales agency for AEC unclassified reports although a small number of other AEC unclassified reports is available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Many AEC unclassified reports are available from the Office of Technical Services in full size printed copy form; others are for sale as photostat copy (full size) or in microfilm form. Reports available from the Superintendent of Documents are in full size printed form only. The price of each item, the form in which copy is available, and the sales source are indicated with each abstract and in the "Availability" column of the Numerical

Index of Reports. Price lists of the Office of Technical Services and of the Superintendent of Documents may be obtained upon request from these sales outlets. Reports should be ordered by report number and title. A check or money order made payable to the Treasurer of the United States should accompany each order. Foreign purchasers of reports, other than those in Canada and Mexico, should include an additional amount for postage, according to the scale that four pages approximate an ounce. It is the purchaser's responsibility to compute the necessary postage, as rates vary for different countries.

In addition to the full-scale copies of certain nonclassified AEC reports which are available from the Office of Technical Services, the Atomic Energy Commission has made contractual arrangements for the sale of microcopy of AEC reports with the following organizations:

Microcard Foundation
P. O. Box 2145
Madison 5, Wis.

Hitchcock Publishing Company
1115 Seventeenth Street, N. W.
Washington, D. C.

Readex Microprint Corp.
100 Fifth Avenue
New York 11, N. Y.

The AEC will negotiate with other firms for the sale of microcopy of reports. If and when such contractual arrangements are completed, they will be announced in future issues of NSA. Requests for prices and any other information concerning the purchase of microcopy should be directed to such sales organizations.

Reports Available Elsewhere. Many of these reports will later appear in scientific and technical journals, or in volumes of the *National Nuclear Energy Series*. An appropriate citation is given in the Numerical Index of Reports for reports when they are published.

Reports Not Published. The AEC depository libraries listed below have been established as convenient points of reference for AEC-developed non-classified information. Each depository library has available for consultation, inter-library loan, and provision of photo-copies, most of the non-classified reports issued by the AEC and its contractors. Where copies of any AEC report are not available in the collections of the depository libraries, any depository library can obtain a copy on loan, upon request to the Technical Information Service Extension, for examination and preparation of a photo-copy.

All AEC depository libraries have agreed to maintain their collections of AEC reports in convenient form for reference use, and supply reference services to their AEC report collections. They have also agreed to supply photocopy services for the AEC reports in their collections at their normal charge for such services. Where AEC materials have been furnished to the depositories in microcard form, copies of the same material may be obtained on loan by any depository from the Technical Information Service Extension, in form suitable for the preparation of photocopies.

Four of the depository libraries listed have been designated as "Industrial Information Depositories." These are: Atomic Industrial Forum, New York, N. Y., Georgia Institute of Technology Library, Atlanta, Ga., John Crerar Library, Chicago, Ill., and Stanford Research Institute, Menlo Park, Calif. In addition to the collections of reports available at the other depository libraries, these Industrial Information Depositories will have available collections of engineering drawings and certain other materials of special interest to industrial requesters. All such materials will be in form suitable for the preparation of copies so that requesters may purchase copies for retention.

Translations. The complete series (NSF-tr) of National Science Foundation translations is available at the depository libraries. Other translations from Russian are available at the Scientific Translation Center, Library of Congress, Washington 25, D. C., and translations from other foreign languages are available at the SLA Translation Pool, John Crerar Library, Chicago, Ill. The availability of translations from these centers is indicated in the Numerical Index of Reports.

Non-AEC Reports. The AEC cannot undertake to supply reports prepared by organizations not under contract to the AEC, except to official requesters. Others should request such reports from the issuing agency indicated in the descriptive cataloging of the report, and in the numerical index. Foreign reports, and reports designated by an NP number, are not available from the AEC, except to official requesters. Requests directed to the originators for NP reports should give the author and title, since NP numbers are applied to such reports by the AEC for its convenience only, and may not be known to the issuing agency.

British reports (AERE series) currently issued are available at all AEC depository libraries. More complete sets of older reports are available at the special depositories of British reports listed below. If a price for a British report is indicated in the "Availability" column of the Numerical Index of Reports, the report is available for purchase from British Information Services, 30 Rockefeller Plaza, New York, N. Y.

Canadian reports (AECL series) are available at the AEC depository libraries, and may be purchased from the Scientific Document Distribution Office, Atomic Energy of Canada Limited, Chalk River, Ontario, Canada; prices are shown in the "Availability" column of the Numerical Index of Reports. Inquiries about other Canadian reports should be made to the issuing agency indicated in the descriptive cataloging of the report, or in the numerical index.

General Information on Location of Index. If the searcher knows the report number, he should look in TID 4000, *Cumulated List of Available Unclassified AEC Reports*, or in the Numerical Index of Reports appearing in *NSA*, Vol. 9, No. 1, et seq. If the searcher does not know the report number, searching is aided by the annual or cumulated subject and author indexes. The indexes refer to an abstract from which the report number may be obtained, and the information regarding availability can then be obtained from the Numerical Index of Reports. Declassified reports numbered MDDC and AECD through 2023 are indexed by subject and author in the separate *Declassified Documents Cumulated Index*, and their abstracts appear in *ADD*, the forerunner to *NSA*. These publications, as well as the first five volumes of *NSA*, are not available for sale but may be consulted at the AEC depository libraries.

USAEC DEPOSITORY LIBRARIES

CALIFORNIA
Berkeley, University of California General Library
Los Angeles, University of California Library
*Menlo Park, Stanford Research Institute
COLORADO
Denver, Denver Public Library
CONNECTICUT
New Haven, Yale University Library
DISTRICT OF COLUMBIA
Washington, Library of Congress
FLORIDA
Gainesville, University of Florida Library
GEORGIA
*Atlanta, Georgia Institute of Technology Library

ILLINOIS
*Chicago, John Crerar Library
Chicago, University of Chicago Library
Urbana, University of Illinois Library
INDIANA
Lafayette, Purdue University Library
IOWA
Ames, Iowa State College Library
KENTUCKY
Lexington, University of Kentucky Library
LOUISIANA
Baton Rouge, Louisiana State University Library
MASSACHUSETTS
Cambridge, Harvard University Library
Cambridge, Massachusetts Institute of Technology Library
MICHIGAN
Ann Arbor, University of Michigan Library
Detroit, Detroit Public Library
MINNESOTA
Minneapolis, University of Minnesota Library
MISSOURI
Kansas City, Linda Hall Library
St. Louis, Washington University Library
NEW JERSEY
Princeton, Princeton University Library
NEW MEXICO
Albuquerque, University of New Mexico Library
NEW YORK
Buffalo, Lockwood Memorial Library
Ithaca, Cornell University Library
*New York, Atomic Industrial Forum
New York, Columbia University Library
New York, New York Public Library
Troy, Rensselaer Polytechnic Institute
NORTH CAROLINA
Durham, Duke University Library
Raleigh, North Carolina State College Library
OHIO
Cincinnati, University of Cincinnati Library
Cleveland, Cleveland Public Library
Columbus, Ohio State University Library
Toledo, University of Toledo Library
OKLAHOMA
Stillwater, Oklahoma Agricultural and Mechanical College Library
OREGON
Corvallis, Oregon State College Library
PENNSYLVANIA
Philadelphia, University of Pennsylvania Library
Pittsburgh, Carnegie Library of Pittsburgh
University Park, Pennsylvania State University, Pattee Library
PUERTO RICO
Rio Piedras, University of Puerto Rico Main Library
TENNESSEE
Knoxville, University of Tennessee Library
Nashville, Joint University Libraries
TEXAS
Austin, University of Texas Library
UTAH
Salt Lake City, University of Utah Library
WASHINGTON
Seattle, University of Washington Library
WISCONSIN
Madison, University of Wisconsin Library

DEPOSITORIES OF BRITISH REPORTS IN U.S. LIBRARIES

British reports (AERE series) currently issued are available at all the AEC depository libraries listed above. More complete sets of older reports are available at the following libraries:

CALIFORNIA
Berkeley, University of California General Library
ILLINOIS
Chicago, John Crerar Library
NEW YORK
New York, New York Public Library
NORTH CAROLINA
Durham, Duke University Library

DEPOSITORIES OF CANADIAN REPORTS IN U.S. LIBRARIES

Canadian reports (AECL series) are available at the AEC depository libraries listed above.

DEPOSITORIES OF USAEC REPORTS IN LIBRARIES OUTSIDE THE U.S.

ARGENTINA
Buenos Aires, Comision Nacional de Energia Atomica
AUSTRALIA
Canberra, Australian National Library
Coogee, New South Wales, Australian Atomic Energy Commission
AUSTRIA
Vienna, Institut für Radiumforschung der Oesterreichischen Akademie der Wissenschaften
BURMA
Rangoon, Union of Burma Applied Research Institute
CANADA
Ottawa, National Research Council Library
DENMARK
Copenhagen, Atomic Energy Commission, c/o Institute of Theoretical Physics
EGYPT
Cairo, Atomic Energy Commission
ENGLAND
Birmingham, Birmingham Central Library
Liverpool, Lancashire County Council Library
London, Science Museum Library
Manchester, Manchester Central Library
Newcastle-on-Tyne, Newcastle Central Library
Sheffield, Sheffield Central Library
FINLAND
Helsinki, Teknillisen Korkeakoulun Kirjasto
FORMOSA (TAIWAN)
Taipei, National Tsing Hua University Library
FRANCE
Gif-sur-Yvette, Centre d'Etudes Nucleaires de Saclay
GREECE
Athens, Greek Atomic Energy Commission
HAITI
Port au Prince, National Library
INDIA
Bombay, Department of Atomic Energy
ISRAEL
Tel Aviv, Israel Atomic Energy Commission
ITALY
Rome, Istituto Nazionale delle Richerche
JAPAN
Tokyo, Science Section, Diet Library
LEBANNON
Beirut, American University
NETHERLANDS
Utrecht, Stichting Reactor Centrum
PAKISTAN
Karachi, Atomic Energy Commission
PERU
Lima, Biblioteca Nacional
PHILIPPINE REPUBLIC
Manila, Interdepartmental Committee on Atomic Energy c/o National Economic Council
PORTUGAL
Lisbon, Junta de Energia Nuclear
SCOTLAND
Glasgow, Corporation of Glasgow Library's Department "Mitchell"
SPAIN
Madrid, Junta de Energia Nuclear
SWEDEN
Stockholm, Atomenergi AB
SWITZERLAND
Geneva, United Nations Library
UNION OF SOUTH AFRICA
Pretoria, Library and Information Division, South African Council for Scientific and Industrial Research
UNITED NATIONS
New York, N. Y., U.N. Headquarters

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* Also serves as an Industrial Information Depository Library.

PERSONAL AUTHOR INDEX

For each reference the digit preceding the dash is the volume number and digits after the dash are the abstract number.

CORPORATE AUTHOR INDEX

For each reference the digit preceding the dash is the volume number and digits after the dash are the abstract number.

SUBJECT INDEX

The number followed by a colon is the volume number, and the numbers following are the abstract numbers. The designation (R) following an abstract number indicates that it is an abstract of a progress report; the designation (J) indicates that it is an abstract of a journal (published literature) article; and the designation (P) indicates that it is an abstract of a patent. Abstract numbers for reports other than progress reports carry no letter designations.

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NUMERICAL INDEX OF REPORTS

Numerical Index of Official Atomic Energy Reports with Indications of Their Availability.

The Numerical Index of Reports is divided into two parts: Part I—all AEC reports abstracted or listed in *NSA* Vol. 10 (1956), together with those AEC reports which were published in the open literature and consequently unavailable in report form; Part II—non-AEC reports, which should not be requested from the Technical Information Extension.

For each reference the number preceding the dash is the volume number, and the numbers following are the abstract numbers.

In addition to the report number and corresponding abstract number, the index includes a brief statement regarding the availability of each AEC report listed; no special efforts were made to determine the availability of non-AEC items, but such information is included when known. For further information regarding the availability of these reports, consult the Introduction to this index.

Nuclear Science Abstracts, Vol. 7, No. 24A, Dec. 31, 1953, includes a cumulated Numerical Index of Reports covering all reports in *Abstracts of Declassified Documents (ADD)* and in *NSA*, Vols. 1–7, together with the latest availability information as of Dec. 31, 1953. Information concerning reports abstracted in *NSA*, Vols. 8 and 9 appears in issue No. 24A of the respective volumes which are dated Dec. 31, 1954 and Dec. 31, 1955. A completely cumulated listing covering all volumes of *ADD* and *NSA* through Vol. 9 is issued as a separate publication, TID-4000 (2nd Edition). Each issue of *NSA*, Vol. 9 (1955) and Vol. 10 (1956), contains information concerning reports abstracted in that issue. All current information is cumulated for the first half of the year in issue No. 12B, and a complete annual cumulation is published as issue No. 24A. In addition, each issue contains new information concerning the availability of reports previously abstracted.

In order to help identify the originator of each series of non-AEC reports, a significant word has been placed in parentheses beside the code. No parenthetical word is shown for series of reports issued by the USAEC. Information regarding the location and acquisition of non-AEC reports appears in the Introduction to this issue.

The Introduction to this issue also contains location and acquisition information to supplement the following explanations of the various types of entries found in the "Availability" column:

NSA
: Nuclear Science Abstracts.

ADD
: Abstracts of Declassified Documents, the predecessor of NSA.

NNES
: National Nuclear Energy Series, published by the McGraw-Hill Book Co.

Sale Price (OTS)
: USAEC report, available from the Office of Technical Services.

Sale Price (GPO)
: USAEC or other report for sale through the U. S. Government Printing Office.

Sale Price (ph OTS or mf OTS)
: Available from the Office of Technical Services, Department of Commerce, Washington 25, D. C., in photostat (ph) or microfilm (mf) form.

Sale Price
: If British report, available from British Information Services. If Canadian report, available from Atomic Energy of Canada Ltd.

In........
: Reports contained in published books.

Reference (Condensed)
: Thesis published in condensed form.

Dep.
: USAEC reports available at the All Depository Libraries as full-size copy for consultation or for sale as photocopies.

Dep.(mc)
: USAEC reports available at the All Depository Libraries only in microcard form. Full-size copies of such reports can be obtained on a loan basis by any All Depository Library on request to the Technical Information Extension.

JCL
: On deposit at the SLA Translation Pool. For information concerning the price of photocopies, inquire of the following address: John Crerar Library, Chicago 1, Illinois, Attn.: SLA Translation Pool.

LC
: On deposit at the Scientific Translation Center. For information concerning the price of photocopies, inquire of the following address: Library of Congress, Washington 25, D. C. Attn.: Scientific Translation Center.

Dep.(mc); Ind. Dep.
: A report held by the other All Depository Libraries in microcard form only is available in full-size copies at the Industrial Depository Libraries.

Journal (without citation)
: Report has been submitted to the journal for publication.

Journal (with specific citation)
: Report has been published as cited.

USGS
: Available from the U. S. Geological Survey, Washington 25, D. C.

NRC
: Available from National Research Council of Canada, Ottawa, Ontario, Canada.

JENER
: Available from the Librarian, Joint Establishment for Nuclear Energy Research, Kjeller per Lillerstrom, Norway.

ASSIGNED CODE DESIGNATIONS

MDDC
: To declassified reports released by the Manhattan Engineer District and by the Atomic Energy Commission before March 1, 1948.

AECD
: To declassified reports released by the Atomic Energy Commission after February 29, 1948 (appeared in April 15, *Nuclear Science Abstracts*).

AECU
: To unclassified reports originating within the Atomic Energy Project. (Subsequent to AECU-871, this code is applied only to reports carrying no other recognized code designation.)

NP
: A file designation assigned by the Technical Information Extension (TIE) to nonproject reports whose codes, if present, are not practical for TIE use.

Other code designations are assigned to unclassified reports by the originating installations.

NUMERICAL INDEX OF REPORTS

PART I

Report	Abstract	Availability
Numerical (Misc.)		
1DR-3	10-2448	See A-502
1DR-28	10-2358	See A-538
1-R128	10-2362	See A-732
2CR-135	10-2471	See A-750
2R-238	10-3462	See A-754
2R-328	10-2359	See A-708
100B-R-140	10-2249	See A-1268
100B-R-199	10-2342	See A-2108
100B-R-243	10-3420	See A-2157
100B-R-244	10-3421	See A-2158
100K-R-654	10-3516	See A-1277
100RD-152	10-3519	See A-3387
100XR-150	10-3510	See A-523
100XR-158	10-3498	See A-796
100XR-1200	10-2360	See A-726
100XR-1216	10-3511	See A-728
100XR-1219	10-2361	See A-731
100XR-1353	10-3466	See A-740
100XR-1466	10-2309	See A-748
A		
4.390.31	10-3753	See AECD-3874
7.390.20	10-3754	See AECD-3909
[illegible]	10-35[illegible]	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
30	10-3509	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
36	10-2355	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
40	10-2565	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
99	10-2356	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
146	10-2468	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
149	10-2305	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
230	10-3680	See C-192
295	10-3403	See CC-264
381	10-3584	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
387	10-3757	See CF-338
419	10-3471	See CE-364
456	10-2357	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
502	10-2448	Superseded by J. Am. Chem. Soc. 69, 2105-7 (1947)
523	10-3510	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
538	10-2358	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
664	10-2397	See CN-527
708	10-2359	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
726	10-2360	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

Report	Abstract	Availability
A		
728	10-3511	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
731	10-2361	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
732	10-2362	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
740	10-3465	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
748	10-2309	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
750	10-2471	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
754	10-3462	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
777	10-2363	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
796	10-3498	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
888	10-2310	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
988	10-3553	See CN-795
100[illegible]	10-3512	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1025	10-3513	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
10[illegible]	10-3514	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1072	10-3751	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1076	10-3419	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
10[illegible]	10-3515	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1185	10-2441	See CT-890
1268	10-2249	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
1268(Suppl.)	10-2342	See A-2108
1277	10-3516	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
1315	10-3713	See CT-883
1432	10-3416	See CL-1039
1449	10-2379	See CN-1060
1481	10-2522	See CE-1074
1507	10-2341	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1511	10-2269	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1570	10-3683	See CE-1132
1615	10-3684	See CE-1149
1636	10-3685	See CE-1150
1874	10-3460	See CC-1321
1999	10-3709	See CP-1350
2004	10-3501	See CK-1359
2010	10-2377	See CC-1366
2024	10-3681	See CC-1383
2043	10-3710	See CP-1456
2108	10-2342	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2157	10-3420	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2158	10-3421	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2207	10-3502	See CK-1529
2339	10-3609	See CT-1571
2354	10-3758	See CP-1589

Report	Abstract	Availability
A		
2260	10-3759	See CP-1598
2263	10-2285	See CC-1432
2314	10-2364	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2321	10-2365	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2412	10-3736	See CP-1676
2431	10-3504	See CN-1702
2437	10-3503	See CK-1712
2443	10-3658	See CP-1729
2445	10-3760	See CP-1732
2553	10-3466	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
2588	10-2311	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2644	10-3748	See CP-1818
2661	10-3608	See CP-1837
2663	10-3715	See CT-1897
2702	10-3517	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2703	10-2366	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2705	10-2367	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2709	10-3518	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2710	10-2324	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2711	10-2270	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2712	10-2271	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2714	10-2368	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2903	10-2272	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2940	10-3422	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2950	10-3601	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
3011	10-2456	See CN-2069
3143	10-2369	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3226	10-2370	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3254	10-2371	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3387	10-3519	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3502	10-3423	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3505	10-3520	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3506	10-3521	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3507	10-3522	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3511	10-2325	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
3513	10-2312	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
3550	10-3523	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3552	10-2313	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3554	10-3524	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3747	10-2314	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3784	10-2400	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3904	10-2250	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3905	10-2251	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3947	10-2566	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3954	10-3463	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3957	10-3624	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
3962	10-2343	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4017	10-2273	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4018	10-3424	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4022	10-2274	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4024	10-3525	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4028	10-2275	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4045	10-822	Dep.; $3.30(ph OTS); $2.40(mf OTS)
4047	10-3741	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)

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A		
4062	10-2372	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4064	10-2373	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
4065	10-2374	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4174	10-2276	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4254	10-2402	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4257	10-2507	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
ACCO		
1	10-660	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
5	10-661	Dep.(mc); $4.80 (ph OTS); $2.70(mf OTS)
8	10-2980	Dep.; $0.20(OTS)
19	10-3111	Dep.; $0.30(OTS)
25	10-2658	Dep.; $0.20(OTS)
27	10-2981	Dep.; $0.25(OTS)
29	10-2659	Dep.; $0.20(OTS)
30	10-742	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
31	10-2677	Dep.; $0.15(OTS)
32	10-2982	Dep.; $0.25(OTS)
33	10-662	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
35	10-2983	Dep.; $0.25(OTS)
36	10-2984	Dep.; $0.25(OTS)
38	10-663	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
38(Suppl.)	10-2043	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
40	10-2985	Dep.; $0.30(OTS)
42	10-2660	Dep.; $0.20(OTS)
46	10-3117	Dep.; $0.40(OTS)
48	10-3118	Dep.; $0.25(OTS)
50	10-664	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
51	10-665	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52	10-2661	Dep.; $0.20(OTS)
53	10-2986	Dep.; $0.25(OTS)
55	10-2678	Dep.; $0.15(OTS)
56	10-1286	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
57	10-666	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
58	10-667	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
59	10-3119	Dep.; $0.20(OTS)
60	10-3049	Dep.; $0.25(OTS)
61	10-2987	Dep.; $0.25(OTS)
ACRH		
4	10-3167	Dep.; $16.80(ph OTS); $5.70(mf OTS)
AEC-tr		
2156	10-3766	Dep.; $0.60(OTS)
2230	10-549	JCL
2232	10-868	LC
2254	10-1131	Associated Technical Services (Trans. 55G6R), East Orange, N. J.
2260	10-869	LC
2266	10-980	LC
2267	10-1588	LC
2268	10-1589	LC
2273	10-5	JCL
2274	10-6	JCL
2275	10-510	JCL

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AEC-tr		
2276	10-7	JCL
2277	10-870	LC
2278	10-306	Associated Technical Services (Trans. 06G7R), East Orange, N. J.
2279	10-229	Associated Technical Services (Trans. 04G7R), East Orange, N. J.
2283	10-224	Columbia Technical Translation (CL-13535, Item A), White Plains, N. Y.
2284	10-225	Columbia Technical Translation (CL-13535, Item B), White Plains, N. Y.
2285	10-108	JCL
2286	10-485	JCL
2287	10-86	JCL
2288	10-321	JCL
2289	10-1017	Consultants Bureau (Collection No. 4 of Soviet Research in High Energy Fission), New York
2290	10-550	JCL
2291	10-551	JCL
2292	10-491	Associated Technical Services (Trans. 01G7R), East Orange, N. J.
2293	10-204	Associated Technical Services (Trans. 59G6R), East Orange, N. J.
2294	10-272	LC
2295	10-333	LC
2296	10-499	LC
2297	10-1119	LC
2298	10-308	Associated Technical Services (Trans. 68G7R), East Orange, N. J.
2299	10-226	Associated Technical Services (Trans. 53G6R), East Orange, N. J.
2300	10-309	Associated Technical Services (Trans. 71G7R), East Orange, N. J.
2301	10-1120	LC
2302	10-273	LC
2303	10-274	LC
2304	10-275	LC
2305	10-1068	Consultants Bureau, New York
2306	10-1069	Consultants Bureau, New York
2307	10-1070	Consultants Bureau (Collection No. 4 of Soviet Research in High Energy Fission), New York
2308	10-1071	Consultants Bureau (Collection No. 4 of Soviet Research In High Energy Fission), New York
2309	10-1121	LC
2310	10-997	LC
2311	10-1102	LC
2312	10-1103	LC
2313	10-871	JCL
2314	10-765	JCL
2315	10-939	JCL
2316	10-902	LC
2317	10-766	LC
2318	10-872	LC
2319	10-930	LC
2320	10-913	Associated Technical Services (Trans. 60G6R), East Orange, N. J.
2324	10-895	Associated Technical Services (Trans. 61G6R), East Orange, N. J.

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AEC-tr		
2325	10-897	Associated Technical Services (Trans. 02G7R), East Orange, N. J.
2326	10-897	
2327	10-1155	JCL
2328	10-588	LC
2329	10-1413	Associated Technical Services (Trans. 69G7R), East Orange, N. J.
2330	10-1414	Associated Technical Services (Trans. 70G7R), East Orange, N. J.
2331	10-958	Available from Associated Technical Services (Trans. 49G7R), East Orange, N. J.
2332	10-1620	Associated Technical Services (Trans. 03G7R), East Orange, N. J.
2333	10-914	Available from Associated Technical Services (Trans. 05G7R), East Orange, N. J.
2334	10-1415	Associated Technical Services (Trans. No. 87G6R), East Orange, N. J.
2335	10-1431	Associated Technical Services (Trans. No. 94G7G), East Orange, N. J.
2338	10-1643	JCL
2339	10-1644	JCL
2340	10-1645	JCL
2341	10-1646	JCL
2342	10-1647	JCL
2344	10-1348	JCL
2345	10-1648	JCL
2347	10-1824	LC
2348	10-1255	LC
2349	10-1416	Associated Technical Services (Trans. 62G7R), East Orange, N. J.
2350	10-1460	Associated Technical Services (Trans. 27G7R), East Orange, N. J.
2351	10-1444	Associated Technical Services (Trans. 94G6R), East Orange, N. J.
2352	10-1243	
2353	10-1257	
2354	10-1324	JCL
2355	10-1962	LC
2356	10-1864	JCL
2357	10-1841	Associated Technical Services (Trans. 97G7R), East Orange, N. J.
2358	10-1945	Associated Technical Services (Trans. 83G7R), East Orange, N. J.
2359	10-1940	Associated Technical Services (Trans. 93G6R), East Orange, N. J.
2360	10-1731	JCL
2361	10-1768	JCL
2362	10-2971	LC
2363	10-2238	LC
2364	10-2060	Associated Technical Services, (Trans. 93G7G), East Orange, N. J.
2365	10-2085	Associated Technical Services (Trans. 95G7G), East Orange, N. J.
2366	10-2086	Associated Technical Services (Trans. 96G7G), East Orange, N. J.
2367	10-2016	Associated Technical Services (Trans. 45G8R), East Orange, N. J.

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AEC-tr		
2368	10-2605	JCL
2369	10-2770	Associated Technical Services (Trans. 84G7R), East Orange, N. J.
2370	10-2869	Associated Technical Services (Trans. 36G8R), East Orange, N. J.
2371	10-2848	LC
2372	10-3019	LC
2373	10-3017	JCL
2374	10-3051	JCL
2375	10-2705	JCL
2376	10-2618	JCL
2377	10-2737	JCL
2379	10-2706	JCL
2380	10-2901	LC
2382	10-3223	LC
383	10-3242	LC
384	10-3131	LC
385	10-3094	JCL
386	10-3238	LC
387	10-3152	Associated Technical Services (Trans. 82H8R), East Orange, New Jersey
388	10-3326	JCL
389	10-3170	LC
391	10-3138	Associated Technical Services (Trans. 83H8R), East Orange, New Jersey
393	10-3296	JCL
394	10-3302	JCL
395	10-3224	Associated Technical Services (Trans. 93H8R), East Orange, N. J.
396	10-3171	JCL
398	10-3245	JCL
399	10-3214	JCL
400	10-3261	JCL
401	10-3263	JCL
402	10-3294	JCL
404	10-3191	JCL
405	10-3306	LC
406	10-3172	LC
407	10-3178	JCL
409	10-3247	Associated Technical Services (Trans. 21H9R), East Orange, N. J.
411	10-3778	JCL
414	10-3208	JCL
415	10-3297	Lawyers & Merchants Translation Bureau, New York
420	10-3264	Associated Technical Services (Trans. No. 41H9G), East Orange, N. J.
421	10-3782	LC
422	10-3783	LC
423	10-3827	JCL
424	10-3828	JCL
26	10-3371	JCL
27	10-3265	JCL
28	10-3831	JCL
29	10-3370	JCL
30	10-3269	LC
31	10-3849	JCL

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AEC-tr		
2432	10-3364	LC
2433	10-3829	JCL
2434	10-3835	JCL
2438	10-3802	JCL
2440	10-3830	JCL
2441	10-3808	JCL
2442	10-3822	JCL
2444	10-3803	JCL
2445	10-3823	JCL
2448	10-3832	LC
2450	10-3781	JCL
2460	10-3840	Associated Technical Services(Trans-26H9G), East Orange, N. J.
AECD		
3634	10-3127	Dep.; $0.25(OTS)
3650	10-884	Dep.; $0.15(OTS)
3651	10-757	Dep.; $0.20(OTS)
3653	10-1085	Dep.; $0.30(OTS)
3655	10-1013	Phys. Rev. 102, 823-30(1956) (Condensed)
3656	10-373	Dep.; $0.20 (OTS)
3661	10-3030	Dep.; $0.40(OTS)
3662	10-604	Dep.; $0.15(OTS)
3663	10-1636	Dep.; $0.30(OTS)
3664	10-560	Dep.; $0.40(OTS)
3665	10-1803	Dep.; $0.20(OTS)
3666	10-1544	Dep.; $0.50(OTS)
3668	10-1921	Dep.; $0.45(OTS)
3670	10-1545	Dep.; $0.15(OTS)
3671	10-1315	Dep.; $0.15(OTS)
3672	10-1765	Dep.; $0.15(OTS)
3673	10-2070	Dep.; $0.35(OTS)
3674	10-1230	Superseded by LA-1721(Rev.)
3675	10-1546	Dep.; $0.30(OTS)
3677	10-1922	Dep.; $0.55(OTS)
3678	10-1027	Dep.(mc); $63.00(ph OTS); $11.10(mf OTS)
3679	10-2021	Dep.; $0.45(OTS)
3680	10-1804	Dep.; $0.40(OTS)
3681	10-2161	Dep.; $0.35(OTS)
3682	10-2162	Dep.; $0.45(OTS)
3683	10-117	Dep.(mc); $3.30 (ph OTS); $2.40 (mf OTS)
3684	10-11	Dep.(mc); $10.80 (ph OTS); $3.90 (mf OTS)
3685	10-12	Dep.(mc); $12.30 (ph OTS); $4.50 (mf OTS)
3686	10-13	Dep.(mc); $10.80 (ph OTS); $3.90 (mf OTS)
3688	10-829	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3691	10-2142	Dep.; $0.30(OTS)
3693	10-3008	Dep.; $0.30(OTS)
3694	10-668	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
3695	10-546	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
3696	10-2071	Dep.; $0.20(OTS)
3698	10-1316	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3699	10-3855	Dep.; $0.20(OTS)
3700	10-2988	Dep.; $0.30(OTS)
3701	10-2679	Dep.; $0.30(OTS)
3702	10-3129	Dep.; $0.15(OTS)

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AECD		
3703	10-3120	Dep.; $0.35(OTS)
3704	10-2702	Dep.; $0.35(OTS)
3705	10-3335	Dep.; $0.35(OTS)
3706	10-3824	Dep.; $0.40(OTS)
3707	10-3856	Dep.; $0.30(OTS)
3708	10-3336	Dep.; $0.15(OTS)
3709	10-3857	Dep.; $0.20(OTS)
3710	10-1231	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3711	10-3858	Dep.; $0.15(OTS)
3713	10-3796	Dep.; $0.20(OTS)
3714	10-1188	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3715	10-3381	Dep.; $0.15(OTS)
3716	10-3382	Dep.; $0.25(OTS)
3717	10-3805	Dep.; $0.25(OTS)
3718	10-3218	Dep.; $0.15(OTS)
3719	10-3383	Dep.; $0.20(OTS)
3720	10-3859	Dep.; $0.15(OTS)
3721	10-3860	Dep.; $0.15(OTS)
3724	10-3310	Dep.; $0.20(OTS)
3726	10-2797	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3727	10-2978	Dep.; $0.15(OTS)
3728	10-3254	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3734	10-3288	Dep.; $4.80(ph OTS); $2.70(mf OTS)
3735	10-3806	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
[illegible]	10-3833	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3777	10-2252	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3787	10-3634	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3789	10-2449	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3790	10-2277	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3791	10-2494	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
[illegible]	10-2495	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3793	10-2253	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3799	10-2469	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3800	10-2434	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3801	10-2375	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3803	10-2435	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3805	10-2376	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3807	10-3478	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3808	10-2244	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3809	10-2326	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3810	10-3479	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
3811	10-2278	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3812	10-2403	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
3813	10-2462	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3814	10-2254	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3817	10-2242	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3825	10-2279	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3826	10-2255	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3828	10-2436	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3829	10-2280	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3830	10-2470	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
3836	10-2281	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3841	10-2557	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3842	10-2548	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3845	10-2282	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3846	10-3649	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
3847	10-3589	Dep.(mc); $3.00(ph OTS); $2.40(mf OTS)
3848	10-3642	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3849	10-3643	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3850	10-3425	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3851	10-3526	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3854	10-3527	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3856	10-3752	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3859	10-3481	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3862	10-3672	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3864	10-3616	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3865	10-3474	Dep.; $3.30(ph OTS); $2.40(mf OTS)
3867	10-3528	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3866	10-3673	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3874	10-3753	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3875	10-3529	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3891	10-3602	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
3896	10-3592	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3897	10-3530	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3901	10-3581	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3903	10-3603	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
3905	10-3482	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
3908	10-3531	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3909	10-3754	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3910	10-3532	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3911	10-3533	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
3916	10-3604	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3917	10-3534	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3924	10-2508	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3927	10-2256	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
[illegible]	10-3738	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
3930	10-3733	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3931	10-3674	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3932	10-3535	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
[illegible]	10-3536	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3937	10-3537	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3941	10-3734	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3945	10-3538	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3947	10-3539	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3949	10-3605	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
3951	10-3590	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
[illegible]	10-3540	Dep.(mc); $3.50(ph OTS); $2.40(mf OTS)
3953	10-3541	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3954	10-3542	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3955	10-3543	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3959	10-3544	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3960	10-3545	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3965	10-3546	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3966	10-3619	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
3971	10-3675	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
[illegible]	10-3742	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)

Report	Abstract	Availability
AECD		
3989	10-3676	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3991	10-3426	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3994	10-3665	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
AECU		
2924	10-319	Dep.; $0.10 (OTS)
2979	10-125	Dep.; $0.15 (OTS)
3031	10-3311	Dep.; $1.25(OTS)
3037	10-758	Dep.; $0.20(OTS)
3039	10-50	Dep.; $0.15 (OTS)
3043	10-512	Dep.; $0.25(OTS)
3046	10-406	Dep.; $12.30 (ph OTS); $4.50 (mf OTS)
3050	10-14	Dep.; $0.25 (OTS)
3058	10-561	Dep.; $6.30(ph OTS); $3.00(mf OTS)
3062	10-2163	Dep.; $1.75(OTS)
3064	10-1720	Dep.; $1.00(OTS)
3071	10-1287	Dep.; $0.30(OTS)
3076	10-1331	Dep.; $0.25(OTS)
3077	10-2025	Dep.; $0.65(OTS)
3078	10-1868	Dep.; $0.60(OTS)
3079	10-1718	Dep.; $0.35(OTS)
3081	10-885	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
3082	10-886	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3083	10-735	Ind. Eng. Chem. 47, 2536-9(1955)
3084	10-562	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3085	10-741	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3086	10-993	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3087	10-146	J. Electrochem. Soc. 103, 64-72(1956)
3088	10-994	J. Chem. Phys. 23, 2105-7(1955)
3089	10-483	Dep.(mc); $4.80 (ph OTS); $2.70 (mf OTS)
3090	10-231	Dep.(mc); $3.30 (ph OTS); $2.40 (mf OTS)
3091	10-228	J. Chem. Phys. 23, 2045-9(1955)
3092	10-307	J. Phys. Chem. 60, 498-9(1956)
3093	10-200	J. Chem. Phys. 24, 124-30(1956)
3094	10-487	Dep.(mc); $1.80 (ph OTS); $1.80 (mf OTS)
3095	10-632	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3096	10-173	Dep.(mc); $1.80 (ph OTS); $1.80 (mf OTS)
3097	10-633	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3098	10-743	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3099	10-15	Dep.(mc); $7.80 (ph OTS); $3.30 (mf OTS)
3100	10-535	Dep.; $0.35(GPO)
3101	10-2970	Dep.; $0.30(OTS)
3102	10-1438	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3103	10-909	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3104	10-1014	Phys. Rev. 101, 1131-42(1956)
3106	10-995	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
3107	10-941	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3108	10-1028	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3109	10-1160	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
3110	10-1506	Dep.(mc); $31.80(ph OTS); $9.30(mf OTS)
3111	10-1129	Phys. Rev. 102, 331-40(1956)
3112	10-3021	Dep.; $0.15(OTS)

Report	Abstract	Availability
AECU		
3113	10-3101	Dep.; $0.50(OTS)
3115	10-1327	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
3116	10-1208	Dep.; $13.80(ph OTS); $4.80(mf OTS)
3117	10-1202	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
3119	10-1778	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
3120	10-1805	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3121	10-1903	Dep(mc); $12.30(ph OTS); $4.50(mf OTS)
3122	10-2226	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3125	10-1836	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3127	10-2127	Dep.(mc); $28.80(ph OTS); $8.40(mf OTS)
3130	10-2574	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3131	10-2625	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3132	10-2005	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
3133	10-2575	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
3134	10-2576	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
3135	10-2006	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3136	10-2883	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3139	10-3767	Dep.; $1.00(OTS)
3140	10-2969	Dep.; $15.30(ph OTS); $5.40(mf OTS)
3141	10-2964	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3142	10-2648	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3145	10-3044	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3147	10-3153	Phys. Rev. 102, 486-8(1956)
3155	10-3201	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3156	10-3202	Dep.(mc): $3.30(ph OTS); $2.40(mf OTS)
3157	10-3298	Dep.; $10.80(ph OTS); $3.90(mf OTS)
3158	10-3291	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
3162	10-3270	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3163	10-3309	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3165	10-3295	
3167	10-3280	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3168	10-3281	Dep.; $1.80(ph OTS); $1.80(mf OTS)
3169	10-3250	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3173	10-3851	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
3179	10-3329	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
AL		
[redacted]	10-2316	See NAA-SR-4
333	10-2317	See NAA-SR-10
ANL		
4397	10-2496	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
[redacted]	10-3650	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
4174	10-3651	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
4177	10-3591	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
4181	10-3547	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
[redacted]	10-3652	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
4277	10-3653	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
4323	10-3654	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
4350	10-3655	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
4400	10-3745	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
[redacted]	10-3677	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
4437	10-3656	Dep.(mc); $19.80(ph OTS); $6.30(mf OTS)

Report	Abstract	Availability
ANL		
4475	10-3644	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4483	10-2509	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
4487	10-3678	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
4509	10-606	Dep.; $0.25(OTS)
4512	10-2510	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4596	10-2511	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
4602	10-3657	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
4654	10-3499	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
4743	10-2748	Dep.; $0.40(OTS)
4769	10-2283	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4801	10-3884	Dep.; $0.20(OTS)
4848	10-777	Dep.; $0.25(OTS)
4912	10-1364	Dep.; $3.30(ph OTS); $2.40(mf OTS)
4926	10-2556	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4951	10-2512	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
4991	10-2428	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5205	10-3784	Dep.; $0.20(OTS)
5206	10-3338	Dep.; $0.15(OTS)
5207	10-3339	Dep.; $0.15(OTS)
5240	10-3330	Dep.; $0.70(OTS)
5322	10-2567	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5334	10-1008	Dep.; $6.30(ph OTS); $3.00(mf OTS)
5354	10-1806	Dep.; $1.00(OTS)
5360	10-3193	Dep.; $0.30(OTS)
5361	10-2042	Dep.; $0.15(OTS)
5367	10-1637	Dep.; $0.55(OTS)
5379	10-3384	Dep.; $0.60(OTS)
5387	10-353	Phys. Rev. 100, 172-3(1955)
5409	10-3800	Dep.; $0.35(OTS)
5412	10-1837	Dep.; $12.30(ph OTS); $4.50(mf OTS)
5431	10-374	Dep.; $1.00 (OTS)
5446	10-1992	Dep.; $7.80(ph OTS); $3.30(mf OTS)
5449	10-1365	Dep.; $6.30(ph OTS); $3.00(mf OTS)
5472	10-3321	Dep.; $0.75(OTS)
5480	10-330	Dep.; $4.80 (ph OTS); $2.70 (mf OTS)
5486	10-1161	Dep.; $16.80(ph OTS); $5.70(mf OTS)
5491	10-1029	Dep.; $1.80(ph OTS); $1.80(mf OTS)
5499	10-3110	Dep.; $1.00(OTS)
5500	10-3355	Dep.; $0.20(OTS)
5501	10-3020	Dep.; $4.80(ph OTS); $2.70(mf OTS)
5512	10-3289	Dep.; $0.30(OTS)
5513	10-3226	Dep.; $0.25(OTS)
5517	10-3028	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5518	10-3327	Dep.; $1.00(OTS)
5522	10-3352	Dep.; $0.50(OTS)
5523	10-3323	Dep.; $4.80(ph OTS); $2.70(mf OTS)
5524	10-3365	Dep.; $0.30(OTS)
5525	10-3380	Dep.; $15.30(ph OTS); $5.40(mf OTS)
5532	10-3861	Dep.; $0.40(OTS)
5545	10-3357	Dep.; $0.20(OTS)
5552	10-3862	Dep.; $0.30(OTS)
ANL-FF		
318G	10-878	J. Metals 7, 1214-18(1955)
ANL-FGF		
2	10-1147	J. Metals 7, 1206-14(1955)
ANL-WMM		
1140	10-3024	Dep.; $0.15(OTS)
APEX		
218	10-1993	Dep.; $4.80(ph OTS); $2.70(mf OTS)
238	10-3004	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
B		
6.460.11	10-3634	See AECD-3787
6.460.14	10-3531	See AECD-3908
BC		
71	10-2345	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
BM-II		
96	10-3132	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
BM-RI		
5169	10-1807	Dep.(mc); Bureau of Mines
5200	10-3284	Dep.(mc); Bureau of Mines
5214	10-3262	Dep.(mc); Bureau of Mines
BMI		
65	10-2437	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
66	10-3407	Dep.; $0.15(OTS)
79	10-3809	Dep.; $0.25(OTS)
97	10-2284	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
245	10-1209	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
261	10-3785	Dep.; $0.25(OTS)
[illegible]	10-669	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
265	10-670	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
271	10-671	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
273	10-672	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
274	10-2999	Dep.; $0.65(OTS)
276	10-673	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
277	10-674	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
278	10-675	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
522	10-2714	Dep.; $0.20(OTS)
550	10-3000	Dep.; $0.30(OTS)
717	10-3810	Dep.; $0.15(OTS)
718	10-3811	Dep.; $0.20(OTS)
725	10-3194	Dep.; $0.15(OTS)
728	10-3009	Dep.; $0.20(OTS)
[illegible]	10-3812	Dep.; $0.30(OTS)
744	10-2438	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
745	10-3161	Dep.; $0.15(OTS)
751	10-3813	Dep.; $0.20(OTS)
753	10-3885	Dep.; $0.20(OTS)
757	10-3358	Dep.; $0.15(OTS)
766	10-2439	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
776	10-2715	Dep.; $0.30(OTS)

Report	Abstract	Availability
BMI		
779	10-831	Dep.; $0.15(OTS)
781	10-1367	Dep.; $0.20(OTS)
784	10-832	Dep.; $0.25(OTS)
793	10-2703	Dep.; $0.25(OTS)
818	10-3814	Dep.; $0.20(OTS)
819	10-3356	Dep.; $0.15(OTS)
829	10-3195	Dep.; $0.25(OTS)
832	10-3010	Dep.; $0.15(OTS)
833	10-3359	Dep.; $0.15(OTS)
835	10-3815	Dep.; $0.20(OTS)
849	10-3366	Dep.; $0.15(OTS)
866	10-3816	Dep.; $0.20(OTS)
870	10-2680	Dep.; $0.15(OTS)
897	10-2681	Dep.; $0.20(OTS)
900	10-2716	Dep.; $0.15(OTS)
951	10-2056	Dep.; $0.15(OTS)
957	10-1368	Dep.; $0.25(OTS)
962	10-2022	Dep.; $0.30(OTS)
978	10-55	Dep.(mc); $6.30 (ph OTS); $3.00 (mf OTS)
980	10-1143	Dep.; $0.20(OTS)
987	10-833	Dep.; $0.25(OTS)
997	10-887	Dep.; $0.15(OTS)
1017	10-834	Dep.; $0.20(OTS)
1026	10-2052	Dep.; $0.35(OTS)
1037	10-176	Dep.; $7.80 (ph OTS); $3.30 (mf OTS)
1041	10-2057	Dep.; $0.20(OTS)
1046	10-3005	Dep.; $0.15(OTS)
1047	10-3006	Dep.; $0.25(OTS)
1052	10-1369	Dep.; $1.80(ph OTS); $1.80(mf OTS).
1056	10-2072	
1067	10-3121	Dep.; $10.80(ph OTS); $3.90(mf OTS)
BMI-JDC		
202	10-3787	Dep.; $0.30(OTS)
BMI-T		
54	10-3385	Dep.; $0.25(OTS)
55	10-3807	Dep.; $0.25(OTS)
BNL		
20	10-2513	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
22	10-2514	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
25	10-3033	Dep.; $0.15(OTS)
69	10-3469	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
86	10-3863	Dep.; $0.25(OTS)
123	10-3864	Dep.; $0.25(OTS)
130	10-3386	Dep.; $0.30(OTS)
143	10-2306	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
146	10-2307	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
152	10-3037	Dep.; $0.45(OTS)
156	10-2308	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
203	10-2053	Dep.; $0.45(OTS)
350	10-3093	Dep.; $1.25(OTS)
354	10-1000	Dep.; $0.15(OTS)
355	10-1	Dep.; $10.80 (ph OTS); $3.90 (mf OTS)

Report	Abstract	Availability
BNL		
357	10-1030	Dep.; $0.20(OTS)
362	10-948	Dep.; $0.10(OTS)
364	10-3387	Dep.; $0.75(OTS)
367	10-3143	Dep.; $0.40(OTS)
370	10-3154	Dep.; $0.20(OTS)
379	10-3373	Dep.; $0.10(OTS)
1149	10-3388	Dep.; $0.20(OTS)
1150	10-3865	Dep.; $0.20(OTS)
1151	10-3389	Dep.; $0.15(OTS)
1152	10-2515	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1328	10-3406	Dep.; $0.45(OTS)
1339	10-3390	Dep.; $0.15(OTS)
1365	10-2552	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1574	10-2489	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1577	10-2562	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1579	10-2516	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1602	10-2517	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1627	10-3038	Dep.; $0.20(OTS)
1690	10-3886	Dep.; $0.15(OTS)
1779	10-3039	Dep.; $0.20(OTS)
1783	10-3227	Dep.; $0.30(OTS)
1785	10-3391	Dep.; $0.15(OTS)
1796	10-3228	Dep.; $0.25(OTS)
1798	10-2440	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1812	10-3229	Dep.; $0.15(OTS)
1814	10-2518	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1986	10-3145	Dep.; $0.15(OTS)
1992	10-3866	Dep.; $0.15(OTS)
2016	10-3392	Dep.; $0.15(OTS)
2019	10-3393	Dep.; $0.20(OTS)
2020	10-3867	Dep.; $0.25(OTS)
2021	10-3394	Dep.; $0.20(OTS)
2022	10-3319	Dep.; $0.20(OTS)
2023	10-3395	Dep.; $0.15(OTS)
2024	10-3396	Dep.; $0.15(OTS)
2025	10-3868	Dep.; $0.15(OTS)
2026	10-3879	Dep.; $0.20(OTS)
2027	10-3397	Dep.; $0.15(OTS)
2028	10-3376	Dep.; $0.20(OTS)
2061	10-2606	Anat. Record 120, 772-3(1954)
2067	10-51	J. Gen. Physiol. 39, 31-53(1955)
2067A	10-52	J. Gen. Physiol. 39, 55-67(1955)
2108	10-315	J. Inorg. and Nuclear Chem. 1, 253(1955)
2119	10-3869	Dep.; $0.30(OTS)
2158	10-3743	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2164	10-1157	Growth 19, 215-44(1955)
2172	10-170	Nature 176, 299-301(1955)
2173	10-1612	J. Chem. Phys. 23, 2060-5(1955)
2174	10-1613	J. Chem. Phys. 23, 2066-8(1955)
2180	10-2607	Exptl. Cell Research 9, 474-88(1955)
2183	10-644	Dep.; $0.15(OTS)
2184	10-3398	Dep.; $0.15(OTS)

Report	Abstract	Availability
BNL		
2192	10-2111	J. Chem. Phys. 23, 2264-7(1955)
2194	10-2174	Phys. Rev. 100, 1302-8(1955)
2227	10-1834	Acta Met. 3, 549-57(1955)
2229	10-1463	Dep.; $0.10(OTS)
2239	10-557	Exptl. Parasitol. 4, 435-44(1955)
2243	10-2653	J. Chem. Phys. 24, 24-32(1956)
2247	10-8	J. Immunol. 75, 203-8(1955)
2259	10-2654	J. Chem. Phys. 24, 56-9(1956)
2260	10-30	Radiation Research 3, 116-20(1955)
2265	10-2039	J. Chem. Phys. 23, 2322-6(1955)
2266	10-1192	Nature 176, 306(1955)
2271	10-2636	J. Biol. Chem. 217, 61-6(1955)
2272	10-1195	Radiation Research 3, 316-30(1955)
2273	10-49	J. Pharmacol. Expt. Therap. 114, 484-9 (1955)
2274	10-1758	Nature 176, 831(1955)
2285	10-1105	Nucleonics 13, No. 11, 110-12(1955)
2295	10-2673	J. Bacteriol. 70, 572-6(1955)
2297	10-2652	J. Chem. Phys. 24, 16-23(1956)
2306	10-1980	Am. J. Physiol. 183, 125-36(1955)
2309	10-1252	Anal. Chem. 27, 1935-9(1955)
2310	10-1253	Anal. Chem. 27, 1939-41(1955)
2342	10-394	Phys. Rev. 100, 32-6(1955)
2349	10-349	Phys. Rev. 100, 74-80(1955)
2350	10-460	Phys. Rev. 100, 81-2(1955)
2354	10-1979	J. Biol. Phot. Assoc. 23, Nos. 2 & 3, 74-7(1955)
2359	10-1260	Nucleonics 13, No. 12, 62(1955)
2372	10-1274	J. Am. Chem. Soc. 77, 5852-5(1955)
2380	10-362	Phys. Rev. 100, 306-23(1955)
2383	10-2519	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2384	10-2520	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2385	10-1548	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2386	10-1549	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2388	10-2327	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2389	10-2201	Phys. Rev. 100, 1334-8(1955)
2390	10-3399	Dep.; $0.15(OTS)
2392	10-2521	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2393	10-3679	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2394	10-3400	Dep.; $0.10(OTS)
2395	10-3146	Dep.; $0.25(OTS)
2396	10-3345	Dep.; $0.15(OTS)
2397	10-1550	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2399	10-2328	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2401	10-1635	Phys. Rev. 100, 1013-14(1955)
2402	10-2132	Phys. Rev. 100, 1487-9(1955)
2408	10-1593	Phys. Rev. 100, 886-90(1955)
2422	[illegible]	Phys. Rev. 100, 324-7(1955)
2428	10-2175	Phys. Rev. 100, 1309-14(1955)
2437	10-1566	Nucleonics 13, No. 12, 64-8(1955)
2445	10-2151	Phys. Rev. 100, 1338-9(1955)
2446	10-2054	Dep.; $1.00(OTS)
2450	10-3251	Dep.; $1.80(ph OTS); $1.80(mf OTS)
2351	10-2640	Geochim. et Cosmochim. Acta 8, 281-4 (1955)
2449	10-3306	Phys. Rev. 101, 388-97(1956)
2453	10-519	Nucleonics 13, No. 11, 128-9(1955)
2457	10-2141	Phys. Rev. 100, 1414-18(1955)
2458	10-2202	Phys. Rev. 100, 1357-63(1955)
2460	10-1634	Phys. Rev. 100, 935-6(1955)
2465	10-2884	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2477	10-2125	Rev. Sci. Instr. 26, 1208-9(1955)
2491	10-2122	Rev. Sci. Instr. 26, 1201-2(1955)
2501	10-1530	Phys. Rev. 100, 943-4(1955)
2502	10-2843	Rev. Sci. Instr. 27, 26-34(1956)
2503	10-2136	Phys. Rev. 100, 1540-1(1955)
2522	10-2925	Phys. Rev. 100, 1787-8(1955)
[illegible]	10-3095	Dep.(mc); $3.20(ph OTS); $2.40(mf OTS)
BP		
13	10-3560	See M-2142
[illegible]	10-2311	See A-2588
29	10-3620	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
[illegible]	10-2313	See A-3552
[illegible]	10-2458	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
[illegible]	10-2463	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
BT		
8	10-3528	See AECD-3867
22	10-2360	See A-726
53	10-2364	See A-2314
60	10-2365	See A-2321
C		
0.350.4	10-3537	See AECD-3937
0.380.1	10-3590	See AECD-3951
0.380.8	10-3536	See AECD-3935
1.365.5	10-3543	See AECD-3955
2.355.1	10-3534	See AECD-3917
2.355.2	10-3542	See AECD-3954
2.355.3	10-3546	See AECD-3965
2.381.4	10-3529	See AECD-3875
4.360.2	10-3541	See AECD-3953
4.360.9	10-3535	See AECD-3932
5.350.3	10-3539	See AECD-3947
5.350.5	10-3540	See AECD-3952
5.350.6	10-3545	See AECD-3960
[illegible]	10-2563	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
[illegible]	10-3680	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
CC		
[illegible]	10-3483	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1321	10-3480	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1366	10-2377	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

Report	Abstract	Availability
CC		
1383	10-3681	Dep.(mc); $13.80(ph OTS); $2.40(mf OTS)
1432	10-2285	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2009	10-1288	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2123	10-3618	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2400	10-3598	See M-4585
2401	10-3484	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2403	10-3427	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2522	10-3755	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2670	10-3428	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2715	10-3598	See M-4585
2933	10-3429	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2957	10-2378	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2962	10-3485	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2994	10-3430	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3069	10-3415	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3101	10-3470	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
3241	10-3431	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS
3302	10-3548	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3336	10-3549	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3489	10-744	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3638	10-3432	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
CD		
454	10-1317	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
564-CEL-A	10-3527	See AECD-3854
954-14	10-3481	See AECD-3859
4003	10-3530	See AECD-3897
4005	10-3538	See AECD-3945
4016	10-3544	See AECD-3959
5560	10-3592	See AECD-3896
CE		
364	10-3471	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
805	10-3682	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
1074	10-2522	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1132	10-3683	Dep.(mc); $19.80(ph OTS); $6.30(mf OTS)
1149	10-3684	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
1150	10-3685	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
CF (Argonne National Lab.)		
863	10-3646	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3341	10-3707	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
CF (Columbia Univ.)		
338	10-3757	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
CF (ORNL)		
45-2-1	10-3732	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
45-6-144	10-2286	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
46-6-23	10-3686	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
47-4-34	10-3687	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
47-8-240	10-2245	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
47-9-305	10-2523	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
47-9-370	10-2541	See M-4128
47-12-58	10-2450	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

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CF (ORNL)		
48-2-139	10-3688	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
48-8-328	10-2549	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
48-9-128	10-2564	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
48-10-219	10-3433	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
49-1-193	10-2524	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
49-1-238	10-2525	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
49-4-123	10-2526	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
49-9-69	10-2527	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
49-11-48	10-3689	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
49-11-217	10-2528	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
49-11-226	10-2529	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
49-12-1	10-3690	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
49-12-18	10-3691	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
49-12-30	10-3692	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
49-12-48	10-3693	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
49-12-82	10-3694	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
49-12-83	10-3695	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
50-1-45	10-2558	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
50-1-157	10-2559	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
50-4-17	10-3696	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
50-4-148	10-3697	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
50-5-140	10-3698	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
50-8-85(Rev.)	10-2560	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
50-9-139	10-3699	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-2-102	10-3550	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
51-6-91	10-2338	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
51-7-106	10-3700	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-7-120	10-3486	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
51-9-63	10-2246	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-9-112	10-2530	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
51-10-28	10-3487	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-10-97	10-3475	Dep.; $21.30(ph OTS), $6.90(mf OTS)
51-11-44	10-3551	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
51-12-1	10-2531	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
51-12-67	10-3552	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-2-55	10-3645	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-2-72	10-2287	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52-2-164	10-3488	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-2-217	10-2329	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52-2-232	10-3701	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
52-3-34	10-2396	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
52-3-134	10-2532	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-3-155	10-2321	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52-4-39	10-2533	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52-4-157	10-2561	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
52-5-211	10-2553	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
52-6-33	10-3606	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-6-67	10-3018	Dep.; $0.15(OTS)
52-9-75	10-3702	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
52-12-118	10-2534	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
53-1-283	10-3489	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
53-4-48	10-2535	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
53-5-105	10-3859	See AECD-3720

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CF (ORNL)		
53-5-139	10-3382	See AECD-3716
53-9-96	10-3756	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
53-9-134	10-3703	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-1-104	10-3383	See AECD-3719
54-2-159	10-3666	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-3-171	10-3607	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
54-3-175	10-3704	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
54-5-200	10-3744	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
54-11-15	10-3805	See AECD-3717
54-12-143	10-3705	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-1-120	10-3706	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-1-94	10-3325	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-1-130	10-3266	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-1-162	10-3248	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-2-78	10-3219	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
56-2-79	10-3312	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-2-90	10-3279	Dep.; $1.80(ph OTS); $1.80(mf OTS)
56-3-60	10-3173	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
56-3-65	10-3243	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
56-3-170	10-3850	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
CH		
2782	10-3408	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
CHEM-S		
231	10-3565	See RL-4.6.231
CK		
942	10-3500	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1359	10-3501	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1529	10-3502	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1712	10-3503	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
CL		
1039	10-3416	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
CL-SCS		
1	10-3673	See AECD-3869
CN		
527	10-2397	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
795	10-3553	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1060	10-2379	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1702	10-3504	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
2041	10-3434	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
2043	10-2972	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2069	10-2456	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
2088	10-2346	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
2834	10-3593	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
CNL		
17	10-2490	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
39	10-2380	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
41	10-3490	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)

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COO		
207	10-1370	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
210	10-1162	Dep.; $7.80(ph OTS); $3.30(mf OTS)
1015	10-3292	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
CP		
499	10-3708	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
597	10-3647	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1350	10-3709	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1456	10-3710	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1589	10-3758	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
1598	10-3759	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1662	10-3711	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1676	10-3736	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1729	10-3658	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
1732	10-3760	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1818	10-3748	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1837	10-3608	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2261	10-3746	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2541	10-3636	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2568	10-3659	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
2907	10-3712	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
CRD-A		
19-27(Pt. 3)	10-3604	See AECD-3916
19-27(Pt. 5)	10-3605	See AECD-3949
CRD-T		
2B-20	10-3589	See AECD-3847
2B-47	10-3734	See AECD-3941
4A-18	10-3642	See AECD-3848
4A-23	10-3643	See AECD-3849
CT		
816	10-3761	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
883	10-3713	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
890	10-2441	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
940	10-3714	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1571	10-3609	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
1897	10-3715	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3522	10-836	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3718	10-837	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
CU		
11-56-AT-1042-Ch.E.	10-3187	See NYO-7638
97-56-ONR-1-Phys.	10-3032	See NEVIS-16
144	10-3852	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
CWC-ED		
1	10-3468	See M-4558
D		
4.250.13	10-3619	See AECD-3966
21	10-2273	See A-4017

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D		
23	10-3424	See A-4018
28	10-2274	See A-4022
D-R		
29	10-2370	See A-3226
60	10-2371	See A-3254
DC		
55-4-46	10-3004	See APEX-238
55-7-41	10-3838	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
DCF		
5704	10-1803	See AECD-3665
DOW		
62	10-676	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
63	10-677	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
67	10-678	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
68	10-679	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
69	10-680	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
72	10-681	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
74	10-682	Dep.(mc); $15.30(ph OTS) $5.40(mf OTS)
76	10-566	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
79	10-683	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
80	10-684	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
81	10-3112	Dep.; $0.45(OTS)
82	10-2749	Dep.; $0.15(OTS)
83	10-685	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
84	10-686	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
85	10-687	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
86	10-688	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
87	10-689	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
88	10-690	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
89	10-1289	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
92	10-745	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
93	10-691	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
94	10-692	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
95	10-693	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
96	10-694	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
97	10-695	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
99	10-696	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
100	10-697	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
101	10-698	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
103	10-699	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
104	10-700	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
105	10-701	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
107	10-702	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
108	10-703	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
109	10-704	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
10	10-705	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
13	10-706	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
DOW		
114	10-707	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
115	10-708	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
116	10-709	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
117	10-710	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
119	10-2662	Dep.; $0.20(OTS)
120	10-711	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
122	10-712	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
125	10-713	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
127	10-714	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
129	10-715	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
131	10-3122	Dep.; $0.55(OTS)
132	10-716	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
136	10-717	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
138	10-2044	Dep.; $4.80(ph OTS); $2.70(mf OTS)
141	10-3180	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
DP		
33	10-3142	Dep.; $0.30
64	10-3377	Dep.; $0.20(OTS)
72	10-3331	Dep.; $0.15(OTS)
74	10-3435	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
75	10-3436	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
76	10-1235	Dep.; $0.25(OTS)
100	10-2536	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
DPW		
2071	10-3752	See AECD-3856
DR		
971	10-3668	See M-2273
972	10-3669	See M-2554
973	10-3670	See M-2555
EAH		
69	10-3621	See EAH-87
87	10-3621	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
ETL		
1	10-2408	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2	10-2409	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3 and 4	10-2410	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
5	10-2411	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
6	10-2412	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
7	10-2413	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
8	10-2414	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
9	10-2415	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
10	10-2416	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
11	10-2417	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
12	10-2418	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
13	10-2419	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
14 and 15	10-2420	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16 and 17	10-2421	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

Report	Abstract	Availability
ETL		
18	10-2422	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
19	10-2423	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
20	10-2424	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
21	10-2425	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
22	10-2426	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
23	10-2427	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
FMPC		
310	10-2457	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
GE-HB		
7	10-2507	See A-4257
GE-HH		
5	10-2402	See A-4254
H		
4.360.12	10-3533	See AECD-3911
4.360.14	10-3532	See AECD-3910
HEPL (Misc.)		
88	10-1014	See AECU-3104
HW		
7737	10-2288	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
8309	10-2381	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
10137	10-2382	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
10940	10-3716	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
11379	10-2480	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
12450	10-2383	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
12552	10-3594	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
12832	10-3762	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
13167	10-2537	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
13300	10-3437	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
13301	10-2289	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
13650	10-2481	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
14226	10-2290	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
15044	10-2291	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
15204	10-2482	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
15742	10-2330	Dep.(mc): $1.80(ph OTS); $1.80(mf OTS)
15829	10-3595	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
15846	10-3438	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
17046	10-2292	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
17175	10-3439	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
17266	10-2347	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
17521	10-2339	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
17775	10-2398	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
18003	10-2429	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
18146	10-2293	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
18320	10-3440	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
18476	10-2399	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
19284	10-2315	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

Report	Abstract	Availability
HW		
19563	10-2538	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
20722	10-2539	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
20765	10-3596	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
21520	10-2430	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
21793	10-1032	Dep.; $0.25(OTS)
22420	10-2294	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
23314	10-2431	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
23581	10-2442	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
25108	10-2247	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
25239	10-3410	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
25337	10-2432	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
26207	10-949	Dep.; $0.25(OTS)
26323	10-2433	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
27061	10-1552	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
27090	10-3637	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
27910	10-2675	Anal. Chem. 28, 274(1956)
29748	10-1033	Dep.; $0.15(OTS)
30119	10-2577	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
30643(Rev.)	10-61	Dep.; $0.20(OTS)
30898	10-3441	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
32516	10-2810	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
32534	10-2811	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
32696	10-2812	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
32720	10-2813	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
34079(Rev.)	10-2048	Dep.; $0.20(OTS)
34499	10-3183	Dep.; $6.30(ph OTS); $3.00(mf OTS)
35038	10-1554	Dep.; $0.25(OTS)
35917	10-513	Dep.; $28.80(ph OTS); $8.40(mf OTS)
36092	10-792	Dep.; $0.30(OTS)
[illegible]	10-1203	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
36831	10-608	Dep.; $0.30(OTS)
37636	10-3190	Dep.; $0.15(OTS)
37983	10-759	Welding J. (N. Y.) 35, 307-10(1956)
38079	10-838	Dep.; $6.30(ph OTS); $3.00(mf OTS)
38198	10-3409	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
38218(Rev.)	10-3003	Dep.; $0.20(OTS)
38387	10-376	Dep.; $4.80 (ph OTS); $2.70 (mf OTS)
38582	10-3141	Dep.; $0.10(OTS)
38757	10-3774	Dep.; $9.30(ph OTS); $3.60(mf OTS)
38758	10-1163	Dep.; $7.80(ph OTS); $3.30(mf OTS)
38876	10-1034	Dep.; $0.20(OTS)
38912	10-1638	Dep.; $0.10(OTS)
38962	10-2091	Dep.; $4.80(ph OTS); $2.70(mf OTS)
38991	10-1446	Dep.; $4.80(ph OTS); $2.70(mf OTS)
39087	10-1318	Dep.; $0.15(OTS)
39170	10-1857	Dep.; $0.20(OTS)
39190	10-1810	Dep.; $4.80(ph OTS); $2.70(mf OTS)
39556	10-1695	Dep.; $0.30(OTS)
39432	10-3337	Dep.(mc); $19.80(ph OTS); $6.30 (mf OTS)
39569	10-3049	Dep.; $0.10(OTS)

Report	Abstract	Availability
HW		
39767	10-3001	Dep.; $0.15(OTS)
39805	10-2718	Dep.; $1.80(ph OTS); $1.80(mf OTS)
39945	10-2614	Dep.; $1.80(ph OTS); $1.80(mf OTS)
39969	10-3002	Dep.; $0.25(OTS)
39971	10-3105	Dep.; $3.30(OTS); $2.40(mf OTS)
40142	10-2977	Dep.; $9.30(ph OTS); $3.60(mf OTS)
40285	10-3106	Dep.; $1.80(ph OTS); $1.80(mf OTS)
40459	10-3209	Dep.; $4.80(ph OTS); $2.70(mf OTS)
40460	10-3125	Dep.; $4.80(ph OTS); $2.70(mf OTS)
40494	10-3050	Dep.; $0.20(OTS)
40497	10-3107	Dep.; $4.80(ph OTS); $2.70(mf OTS)
40866	10-3360	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
41025	10-3275	Dep.; $1.80(ph OTS); $1.80(mf OTS)
41713	10-3780	Dep.; $0.10(OTS)
HW-R		
13051	10-3474	See AECD-3865
IDO		
14313	10-746	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
14334	10-115	Dep.; $0.40 (OTS)
14336	10-1453	Dep.; $0.20(OTS)
14347	10-2655	Dep.; $0.25(OTS)
14352	10-839	Dep.; $4.80(ph OTS); $2.70(mf OTS)
14357	10-1737	Dep.; $0.25(OTS)
16005	10-3870	Dep.; $0.30(OTS)
16014	10-1035	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16020	10-1036	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16022	10-2886	Dep.; $0.15(OTS)
16026	10-1037	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16031	10-1038	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16035	10-1039	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16036	10-2887	Dep.; $0.20(OTS)
16047	10-1555	Dep.; $0.70(OTS)
16056	10-2483	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16057	10-1100	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16064	10-3871	Dep.; $0.25(OTS)
16067	10-2139	Dep.; $0.20(OTS)
16071	10-1040	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
16074	10-128	Dep.; $0.10 (OTS)
16075	10-1041	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16076	10-2750	Dep.; $0.15(OTS)
16078	10-3717	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
16083	10-1042	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16084	10-1924	Dep.; $0.20(OTS)
16093	10-1043	Dep.; $0.15(OTS)
16095	10-2888	Dep.; $0.25(OTS)
16100	10-2889	Dep.; $0.30(OTS)
6105	10-2890	Dep.; $0.20(OTS)
6114	10-2165	Dep.; $0.25(OTS)

Report	Abstract	Availability
IDO		
16118	10-3401	Dep.; $0.25(OTS)
16125	10-1044	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16127	10-1045	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16131	10-1046	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
16133	10-1047	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16136	10-1048	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16138	10-377	Dep.(mc); $10.80 (ph OTS); $3.90 (mf OTS)
16140	10-1049	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
16141	10-567	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16155	10-1050	Dep.; $7.80(ph OTS); $3.30(mf OTS)
16161	10-2891	Dep.; $0.25(OTS)
16168	10-3158	Dep.; $4.80(ph OTS); $2.70(mf OTS)
16173	10-2108	Dep.; $0.25(OTS)
16179	10-378	Dep.(mc); $4.80 (ph OTS); $2.70 (mf OTS)
16180	10-2166	Dep.; $0.20(OTS)
16182	10-2892	Dep.; $0.25(OTS)
16186	10-1051	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16187	10-1052	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16189	10-2026	Dep.; $0.30(OTS)
16195	10-1144	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
16200	10-1053	Dep.; $0.25(OTS)
16208	10-2893	Dep.; $0.35(OTS)
16210	10-379	Dep.; $0.20 (OTS)
16211	10-1614	J. Chem. Phys. 23, 2108-10(1955)
16213	10-3147	Dep.; $0.60(OTS)
16214	10-1925	Dep.; $0.25(OTS)
16223	10-241	Dep.; $0.20 (OTS)
16226	10-1907	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
16241	10-380	Dep.; $0.20 (OTS)
16243	10-381	Dep.; $0.30 (OTS)
16246	10-1087	Dep.; $4.80(ph OTS); $2.70(mf OTS)
16247	10-3157	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
16248	10-3040	Dep.; $0.20(OTS)
16249	10-1054	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16250	10-3041	Dep.; $0.20(OTS)
16251	10-2894	Dep.; $0.15(OTS)
16252	10-3148	Dep.; $4.80(ph OTS); $2.70(mf OTS)
16259	10-3825	Dep.; $0.30(OTS)
IMCC		
2041	10-65	See RMO-2021
2166	10-1294	See RMO-2032
2208	10-1295	See RMO-2037
2209	10-1296	See RMO-2038
2210	10-1297	See RMO-2039
2212	10-3113	See RMO-2041
ISC		
247	10-568	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
377	10-2719	Dep.; $0.35(OTS)

Report	Abstract	Availability
ISC		
458	10-2989	Dep.; $0.30(OTS)
463	10-2720	Dep.; $0.20(OTS)
505	10-62	Dep.(mc); $4.80 (ph OTS); $2.70 (mf OTS)
527	10-3887	Dep.; $0.30(OTS)
530	10-569	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
536	10-109	Dep.(mc); $3.30 (ph OTS); $2.40 (mf OTS)
539	10-79	Anal. Chem. 27, 1737-41(1955)
540	10-80	Dep.(mc); $3.30 (ph OTS); $2.40 (mf OTS)
545	10-840	J. Metals 8, 132-6(1956)
549	10-718	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
555	10-1518	Dep.; $0.35(OTS)
563	10-2032	J. Chem. Phys. 23, 2258-63(1955)
574	10-570	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
579	10-1742	Anal. Chem. 28, 79-81(1956)
584	10-609	Dep.; $0.20(OTS)
586	10-3102	Dep.; $0.50(OTS)
588	10-2180	Dep.; $0.40(OTS)
596	10-1236	Dep.; $0.25(OTS)
612	10-2045	Dep.; $0.45(OTS)
613	10-1602	Phys. Rev. 100, 796-8(1955)
617	10-1755	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
622	10-3048	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
623	10-1741	Anal. Chem. 28, 18-21(1956)
624	10-1827	Metal Progr. 68, No. 6, 77-80(1955)
629	10-2207	Phys. Rev. 100, 1407-9(1955)
634	10-634	Dep.; $0.25(OTS)
642	10-1774	Dep.; $0.15(OTS)
643	10-571	Dep.; $0.20(OTS)
644	10-3196	Dep.; $0.25(OTS)
645	10-331	Dep.; $0.25 (OTS)
656	10-3011	Dep.; $4.80(ph OTS); $2.70(mf OTS)
663	10-3108	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
676	10-3022	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
682	10-2990	Dep.; $0.15(OTS)
688	10-3197	Dep.; $4.80(ph OTS); $2.70(mf OTS)
707	10-3367	Dep.; $0.25(OTS)
710	10-3788	Dep.; $0.20(OTS)
716	10-3826	Dep.; $0.35(OTS)
JWD		
40	10-3466	See A-2553
64	10-3423	See A-3502
69	10-3521	See A-3506
70	[redacted]	See A-3507
74	10-2325	See A-3511
76	10-2312	See A-3513
K		
2.19.10	10-2276	See A-4174
39	[redacted]	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
81	[redacted]	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)

Report	Abstract	Availability
K		
101	[redacted]	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
104	10-2340	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
120	10-2682	Dep.; $0.20(OTS)
137	10-2401	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
236	10-3411	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
273	10-3577	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
276	10-2404	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
286	10-2484	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
299(Rev.)	10-3763	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
315	10-3554	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
316	10-3578	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
372	10-3497	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
373	10-3597	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
416	10-3579	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
421	10-3555	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
434	10-3123	Dep.; $0.15(OTS)
447	10-3491	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
482	10-3556	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
497	10-3638	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
513	10-3443	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
706	10-3181	Dep.; $0.25(OTS)
719	10-3557	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
757	10-3639	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
843	10-3464	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1071	10-1703	Dep.; $0.20(OTS)
1088	10-1994	Dep.; $0.15(OTS)
1106	10-3346	Dep.; $0.25(OTS)
1222	10-242	Dep.; $0.20 (OTS)
1223	10-1490	Dep.; $0.20(OTS)
1232	10-1213	Dep.; $0.35(OTS)
1236	10-3837	Dep.; $6.30(ph OTS); $3.00(mf OTS)
1243	10-1335	Dep.; $4.80(ph OTS); $2.70(mf OTS)
1264	10-8353	Dep.; $6.30(ph OTS); $3.00(mf OTS)
1272	10-3841	Dep.; $3.30(ph OTS); $2.40(mf OTS)
1275	10-3883	Dep.; $3.30(ph OTS); $2.40(mf OTS)
1277	10-3374	Dep.; $0.20(OTS)
1284	10-3842	Dep.; $0.25(OTS)
KAPL		
24	10-3718	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
41	10-1056	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
42	10-1001	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
58	10-1057	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
62	10-1639	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
130	10-3587	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
180	10-3340	Dep.; $0.35(OTS)
192	10-1237	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
200	10-3174	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
210	10-3444	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
304	[redacted]	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)

Report	Abstract	Availability
KAPL		
337	10-3198	Dep.; $0.25(OTS)
421	10-2384	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
428	10-3888	Dep.; $0.20(OTS)
527	10-3720	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
528	10-3721	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
531	10-1336	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
532	10-1337	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
546	10-1556	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
551	10-3722	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
789	10-3472	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
813	10-1058	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
828	10-2092	Dep.; $0.20(OTS)
834	10-2663	Dep.; $0.15(OTS)
851	10-2236	Dep.; $0.25(OTS)
854	10-3332	Dep.; $0.15(OTS)
919	10-3404	Dep.; $0.25(OTS)
964	10-3723	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1110	10-3299	Dep.; $0.20(OTS)
1154	10-2683	Dep.; $0.25(OTS)
1158	10-1975	Dep.; $0.15(OTS)
1301	10-1849	Dep.; $0.15(OTS)
1318	10-1002	Dep.; $0.20(OTS)
1376	10-2058	Dep.; $13.80(ph OTS); $4.80(mf OTS)
1377	10-3103	Dep.; $4.80(ph OTS); $2.70(mf OTS)
1384	10-119	Dep.; $0.40 (OTS)
1399	10-243	Dep.; $4.80 (ph OTS); $2.70 (mf OTS)
1403	10-1599	Dep.; $0.30(OTS)
1406	10-1772	Dep.; $0.20(OTS)
1411	10-1372	Dep.; $0.40(OTS)
1414	10-1926	Dep.; $0.20(OTS)
1415	10-2804	Dep.; $0.30(OTS)
1416	10-2073	Dep.; $0.40(OTS)
1422	10-1454	Dep.; $0.25(OTS)
1425	10-1238	Dep.; $0.20(OTS)
1431	10-2615	Dep.; $0.15(OTS)
1443	10-3244	Dep.; $0.25(OTS)
1444	10-1738	Dep.; $3.30(ph OTS); $2.40(mf OTS)
1453	10-3293	Dep.; $0.20(OTS)
1454	10-888	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1463	10-3779	Dep.; $7.80(ph OTS); $3.30(mf OTS)
1467	10-3843	Dep.; $0.15(OTS)
1469	10-3220	Dep.; $0.30(OTS)
1471	10-3872	Dep.; $0.15(OTS)
1523	10-3804	Dep.; $0.25(OTS)
LI		
98	10-2975	Dep.; $0.15(OTS)
LO		
(Rev.)	10-3763	See K-299(Rev.)

Report	Abstract	Availability
KLO		
87	10-3597	See K-373
107	10-3579	See K-416
112	10-3555	See K-421
127	10-3491	See K-447
138	10-3556	See K-482
143	10-3638	See K-497
148	10-3443	See K-513
KLX		
35	10-3558	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
37	10-3559	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1036	10-3588	Dep.(mc); $7.80(ph OTS); $3.00(mf OTS)
1356	10-3477	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1384	10-3635	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1392	10-2322	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
KT		
104	10-3482	See AECD-3905
183	10-2105	Dep.; $0.25(OTS)
KY		
166	10-3203	Dep.; $0.20(OTS)
LA		
28	10-2504	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
42	10-2443	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
44	10-3610	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
47	10-3724	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
55	10-2568	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
76	10-2505	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
78	10-2444	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
81	10-2569	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
91	10-2506	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
112	10-3505	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
147	10-2385	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
149	10-2386	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
172	10-3506	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
243	10-2550	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
266	10-3667	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
313	10-2387	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
347	10-2348	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
381	10-3507	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
502	10-2349	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
507	10-2295	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
603	10-2491	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
609	10-3749	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
639	10-2350	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
695	10-2388	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
696	10-2296	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
703	10-2297	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)

Report	Abstract	Availability
LA		
738	10-2298	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
739	10-2299	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
742	10-3795	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1128	10-2300	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1155	10-3764	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1197	10-2301	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1309	10-1200	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
1314	10-2351	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1315	10-2352	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1336	10-1145	Dep.; $0.25(OTS)
1343	10-2389	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1345	10-2302	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1359	10-2390	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1423	10-3775	Dep.; $0.30(OTS)
1429	10-2391	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
1550	10-2257	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1567	10-3267	See LA-1721(Rev.)
1721(Rev.)	10-3267	$1.25(OTS)
1722	10-3267	See LA-1721(Rev.)
1913	10-1760	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1930	10-3801	Dep.; $0.30(OTS)
1940	10-1619	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1947	10-1739	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1960	10-2171	Dep.; $0.25(OTS)
LAMS		
121	10-3648	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
727	10-2540	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
769	10-2472	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1092	10-1640	Dep.; $0.10(OTS)
1940	10-3160	Dep.; $0.20(OTS)
1973	10-3155	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
LRL		
76	[illegible]	Dep.; $0.20(OTS)
83	10-1938	Dep.; $0.20(OTS)
88	10-2074	Dep.; $0.25(OTS)
101	10-1332	Dep.; $0.20(OTS)
158	10-912	Dep.; $0.35(OTS)
160	10-2459	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
LWS		
[illegible]	[illegible]	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
[illegible]	10-841	Dep.; $0.15(OTS)
22514(Pt.5)	10-3605	See AECD-3949
[illegible]	10-3643	See AECD-3849
[illegible]	10-3734	See AECD-3941
M		
2142	10-3560	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2273	10-3668	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2327	10-3492	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2554	10-3669	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2555	10-3670	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3712	10-3735	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
3832	10-837	See CT-3718
3845	10-3582	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3846	10-3583	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
4087	10-3412	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4136	10-2541	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
4165	10-3585	Dep.(mc); $15.30(ph OTS); $5.40(mf OTS)
4241(Pt. III)	10-3493	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4245	10-1239	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
4337	10-3414	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4430	10-2542	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
4483	10-3494	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4534	10-2303	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4556	10-3467	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
4558	10-3468	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
4576	10-3671	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4585	10-3598	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
MCW		
103	10-3561	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
134	10-3445	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
136	10-3562	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
248	10-747	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
MEMO-LFE		
1	10-3857	See AECD-3709
Memo-NEC		
6	10-1336	See KAPL-531
7	10-1337	See KAPL-532
MIT		
1028	10-3739	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1090	10-3611	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1091	10-2193	Dep.; $0.20(OTS)
1092	10-3817	Dep.; $0.20(OTS)
1105	10-1766	Dep.; $0.20(OTS)
1110	10-1740	Dep.; $0.45(OTS)
MIT-[illegible]		
4	[illegible]	See AECD-3851
8	10-3425	See AECD-3850
14	10-610	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
MITG		
244	10-3563	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
208	[illegible]	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)

Report	Abstract	Availability
MITG-A		
111	10-3347	Dep.; $0.25(OTS)
ML (Misc.)		
265	10-406	See AECU-3046
MLM		
188	10-3617	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
205	10-1427	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
229	10-2485	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
232	10-116	Dep.; $0.20 (OTS)
291	10-3622	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
373	10-3375	Dep.; $0.30(OTS)
567	10-3126	Dep.; $0.35(OTS)
572	10-2112	Dep.; $0.30(OTS)
615	10-1428	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
641	10-3378	See TID-5087
677	10-1429	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
729	10-2684	Dep.; $0.15(OTS)
748	10-3789	Dep.; $0.20(OTS)
761	10-2578	Dep.; $0.40(OTS)
808	10-1430	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
896	10-2195	Dep.; $0.15(OTS)
976	10-3252	Science 121, 97-8(1955) (Condensed)
995	10-2979	Dep.; $6.30(ph OTS); $3.00(mf OTS)
1003	10-3844	Dep.; $0.25(OTS)
1020	10-3300	Dep.; $0.25(OTS)
1022	10-645	Dep.; $0.25(OTS)
1050	10-3163	Dep.; $0.15(OTS)
1052	10-3777	Dep.; $1.80(ph OTS); $1.80(mf OTS)
1055	10-1249	Anal. Chem. 27, 1875-8(1955)
1057	10-2966	Dep.; $0.15(OTS)
1059	10-511	J. Bacteriol. 69, 607-15(1955)
1060	10-1839	Dep.; $0.15(OTS)
MLM-CF		
54-12-2	10-1839	See MLM-1060
MonC		
132	10-3740	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
398	10-3725	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
MonP		
246	10-3873	Dep.; $0.35(OTS)
356	10-3661	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
357	10-3230	Dep.; $0.20(OTS)
360	10-2543	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
428	10-3726	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
434	10-3727	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
457	10-3728	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
MonT		
164	10-3641	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
408	10-2331	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)

Report	Abstract	Availability
MTA		
36	10-2965	Dep.; $0.20(OTS)
41	10-2237	Dep.; $0.20(OTS)
MTRL		
54-91	10-1054	See IDO-16249
54-92	10-3041	See IDO-16250
202	10-3040	See IDO-16248
247	10-1087	See IDO-16246
MUC-AMW		
36	10-3402	See N-985
MUC-WPJ		
14	10-2486	See N-812
N		
812	10-2486	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
985	10-3402	Dep.; $0.15(OTS)
1367	10-2487	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1372	10-2464	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
NAA-AL		
228	10-3672	See AECD-3862
NAA-SR		
4	10-2316	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
10	10-2317	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16	10-2407	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
20	10-2318	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
24	10-2492	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
49	10-2465	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
58	10-2445	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
67	10-2319	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
68	10-2320	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
138	10-3889	Dep.; $0.30(OTS)
168	10-2554	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
196	10-2649	Dep.; $0.25(OTS)
202	10-3786	Dep.; $0.15(OTS)
248	10-2555	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
268	10-3368	Dep.; $0.35(OTS)
275	10-2544	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
286	10-2497	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
287	10-3882	Dep.; $0.25(OTS)
845	10-3853	Dep.; $0.20(OTS)
924	10-3874	Dep.; $0.20(OTS)
926	10-3348	Dep.; $0.25(OTS)
1016	10-3379	Dep.; $0.20(OTS)
1029	10-3313	Dep.; $0.25(OTS)
1057	10-3797	Dep.; $0.20(OTS)
1102	10-3314	Dep.; $0.25(OTS)

Report	Abstract	Availability
NAA-SR		
1137(Pt.1)	10-1495	Dep.; $3.30(ph OTS); $2.40(mf OTS)
1152	10-3405	Dep.; $0.25(OTS)
[redacted]	10-3315	Dep.; $0.20
[redacted]	10-2258	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
1398	10-3156	Dep.; $0.30(OTS)
[redacted]	10-3333	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1452	10-3307	Dep.; $0.30(OTS)
1458	10-2968	Dep.; $1.80(ph OTS); $1.80(mf OTS)
1477	10-3322	Dep.; $0.20(OTS)
1525	10-3316	Dep.; $0.50(OTS)
NAA-SR-Memo		
1104	10-3254	See AECD-3728
1475	10-3149	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
NBL		
117	10-81	Dep.; $0.30 (OTS)
NBS (Misc.)		
[redacted]	10-2304	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
[redacted]	10-488	Dep.; $3.30 (ph OTS); $2.40 (mf OTS)
[redacted]	10-63	Dep.; $3.30 (ph OTS); $2.40 (mf OTS)
[redacted]	10-3361	Dep.; $0.20(OTS)
4161	10-1726	Dep.; $3.30(ph OTS); $2.40(mf OTS)
4342	10-952	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
4420	10-3136	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
4514	10-3217	Dep.(mc); $16.80(ph OTS); $5.70(mf OTS)
NBS-C (Misc.)		
562	10-2976	Dep.(mc); $0.50 GPO
567	10-2787	$1.00(GPO)
[redacted]	10-3185	Dep.; $0.20(GPO)
NBS-D		
[redacted]	10-640	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
131	10-3603	See AECD-3903
NDA		
16	10-3150	Dep.; $9.30(ph OTS); $3.60(mf OTS)
NEVIS		
13	10-2133	Phys. Rev. 100, 1490-3(1955)
16	10-3032	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
NLCO		
595	10-3175	Dep.; $0.75(OTS)
NMI		
1119	10-2077	Dep.; $0.30(OTS)

Report	Abstract	Availability
NYO		
110(Del.)	10-2446	Dep.(mc); $33.30(ph OTS); $9.60(mf OTS)
[redacted]	10-1508	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1093	10-1215	Dep.; $0.20(OTS)
1127	10-2447	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
1323	10-1290	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
[redacted]	10-636	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1455	10-1291	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1516	10-851	Dep.; $0.20(OTS)
1521	10-2248	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
3108	10-578	Dep.; $10.80(ph OTS); $3.90(mf OTS)
3313	10-654	Dep.; $1.50(OTS)
3320	10-515	Dep.; $0.35(OTS)
3345	10-955	Dep.; $0.45(OTS)
3499	10-147	Dep.; $4.80 (ph OTS); $2.70 (mf OTS)
3535	10-3747	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3557	10-732	Anal. Chem. 27, 1770-4(1955)
3559	10-731	Anal. Chem. 27, 1704-7(1955)
3606	10-611	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3738	10-3354	Dep.; $0.15(OTS)
3783	10-1947	J. A. Ceram. Soc. 38, 423-32(1955)
[redacted]	10-3845	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
[redacted]	10-590	J. Am. Chem. Soc. 75, 2777-8(1953)
[redacted]	10-2030	J. Chem. Phys. 23, 2410-14(1955)
3916	10-3124	Dep.; $0.35(OTS)
3918	10-1320	Dep.; $3.30(ph OTS); $2.40(mf OTS)
3919	10-1641	Dep.; $6.30(ph OTS); $3.00(mf OTS)
3920	10-1728	Dep.; $9.30(ph OTS); $3.60(mf OTS)
3921	10-3276	Dep.; $0.20(OTS)
[redacted]	10-1341	Dep.; $0.15(OTS)
4640	10-252	Dep.; $0.20 (OTS)
4641	10-754	Dep.; $0.35(OTS)
[redacted]	10-516	Dep.; $1.00(OTS)
[redacted]	10-10	Dep.; $0.15 (OTS)
[redacted]	10-2593	Dep.; $1.25(OTS)
[redacted]	10-1167	Dep.; $4.80(ph OTS); $2.70(mf OTS)
[redacted]	10-924	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
[redacted]	10-3446	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5119	10-748	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
[redacted]	10-3599	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5130	10-3447	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5131	10-1146	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5134	10-3448	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
[redacted]	10-3417	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
[redacted]	10-3413	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5164	10-3564	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5191	10-719	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5195	10-3765	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5208	10-3449	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5210	10-3450	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

Report	Abstract	Availability
NYO		
5213	10-3451	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5214	10-3452	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5217	10-3453	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5218	10-3454	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
5219	10-3455	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5225	10-3612	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5229	10-3456	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5230	10-3457	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5236	10-3458	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
6148	10-3159	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
6264	10-1229	Mining Eng. 7, 958-62(1955)
6268	10-312	Dep.; $10.80 (ph OTS); $3.90 (mf OTS)
6328	10-2023	Dep.; $0.20(OTS)
6451	10-1342	Dep.; $0.20(OTS)
6457	10-3034	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
6478	10-235	Dep.; $0.30 (OTS)
6482	10-2805	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
6506	10-2997	Dep.; $0.70(OTS)
6590	10-2008	Dep.; $0.20(OTS)
6599	10-1814	Dep.; $0.15(OTS)
6626	10-1601	Dep.; $0.55(OTS)
7048	10-183	Dep.; $1.80 (ph OTS); $1.80 (mf OTS)
7049	10-2081	Dep.; $0.25(OTS)
7050	10-1383	Dep.; $0.25(OTS)
7051	10-2082	Dep.; $0.20(OTS)
7053	10-1384	Dep.; $0.20(OTS)
7054	10-3285	Dep.; $0.30(OTS)
7055	10-1385	Phys. Rev. 101, 1441-2(1956)
7075	10-184	Dep.; $1.80 (ph OTS); $1.80 (mf OTS)
7080	10-3012	Dep.; $0.25(OTS)
7129	10-2669	J. Am. Chem. Soc. 77, 6519-21(1955)
7135	10-1015	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
7137	10-1594	Phys. Rev. 100, 940-2(1955)
7165	10-925	J. Franklin Inst. 261, 373-6(1956)
7173	10-1781	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
7175	10-3189	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
7214	10-1216	Dep.; $0.20(OTS)
7283	10-70	J. Phys. Chem. 59, 1074-6(1955)
7298	10-3133	$4.80(ph OTS); $2.70(mf OTS)
7322	10-2160	Phys. Rev. 100, 1409-14(1955)
7323	10-2104	Rev. Sci. Instr. 26, 112-19(1955)
7326	10-1605	Phys. Rev. 100, 945-6(1955)
7377	10-655	J. Chem. Phys. 23, 1961-2(1955)
7379	10-1944	Dep.; $0.15(OTS)
7455	10-1003	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
7472	10-2769	Phys. Rev. 100, 1627-9(1955)
7477	10-1386	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
7482	10-3199	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
7485	10-3369	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
7597	10-3271	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
7638	10-3187	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)

Report	Abstract	Availability
ORINS		
10	10-544	Dep.; $0.75(OTS)
ORNL		
19	10-2323	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
25	10-2406	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
26	10-2545	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
196	10-1452	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
388	10-3623	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
550	10-2546	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
563	10-3729	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
692	10-2169	Dep.; $0.30(OTS)
701	10-3730	Dep.(mc); $22.80(ph OTS); $7.20(mf OTS)
887	10-579	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
1047	10-720	Dep.; $0.25(OTS)
1064	10-3324	Dep.; $0.25(OTS)
1144	10-3025	Dep.; $0.20(OTS)
1317	10-1118	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1396	10-3109	Dep.; $0.25(OTS)
1419	10-3349	Dep.; $0.20(OTS)
1422	10-3836	Dep.; $1.00(OTS)
1469(Suppl.2)	10-1016	Dep.; $0.30(OTS)
1476	10-3334	Dep.; $0.20(OTS)
1783	10-3890	Dep.; $0.40(OTS)
1790	10-3875	Dep.; $0.30(OTS)
1837	10-1325	Anal. Chem. 27, 1923-7(1955)
1860	10-42	Dep.; $6.30 (ph OTS); $3.00 (mf OTS)
1879	10-320	Dep.; $12.30 (ph OTS); $4.50 (mf OTS)
1888	10-129	Dep.; $12.30 (ph OTS); $4.50 (mf OTS)
1892	10-1459	Dep.; $0.45(OTS)
1897	10-942	Dep.; $0.30(OTS)
1900	10-105	Dep.; $0.15 (OTS)
1907	10-1292	Dep.; $0.25(OTS)
1913	10-1519	Dep.; $0.25(OTS)
1928	10-244	Dep.; $6.30 (ph OTS); $3.00 (mf OTS)
1929	10-1466	Dep.; $0.30(OTS)
1930	10-721	Dep.; $7.80(ph OTS); $3.30(mf OTS)
1932	10-612	Dep.; $0.25(OTS)
1933	10-130	Dep.; $6.30 (ph OTS); $3.00 (mf OTS)
1942	10-43	Dep.; $6.30 (ph OTS); $3.00 (mf OTS)
1945	10-3035	Dep.; $13.80(ph OTS); $4.80(mf OTS)
1950	10-82	Dep.; $3.30 (ph OTS); $2.40 (mf OTS)
1951	10-1240	Dep.; $0.20(OTS)
1952	10-1293	Dep.; $0.30(OTS)
1953	10-1168	Dep.(mc); $22.80(ph OTS); $7.20(mf OTS)
1957	10-210	Dep.; $4.80 (ph OTS); $2.70 (mf OTS)
1958	10-1498	J. Nuclear Energy 2, 153-67(1956)
1966	10-1328	Dep.; $0.20(OTS)
1972	10-489	Dep.; $3.30 (ph OTS); $2.40 (mf OTS)
1975	10-3144	Dep.(mc); $18.30(ph OTS); $6.00(mf OTS)
1983	10-2806	Dep.; $12.30(ph OTS); $4.50(mf OTS)

Report	Abstract	Availability
ORNL		
1987	10-1927	Dep.; $0.60(OTS)
1989	10-2685	Dep.; $6.30(ph OTS); $3.00(mf OTS)
1992	10-1642	Dep.; $4.80(ph OTS); $2.70(mf OTS)
1997	10-3023	Dep.; $4.80(ph OTS); $2.70(mf OTS)
2006	10-3176	Anal. Chem. 28, 1049-51(1956)
2013	10-2816	Dep.; $6.30(ph OTS); $3.00(mf OTS)
2019	10-3880	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2025	10-3186	Dep.; $0.25(OTS)
2026	10-3186	Dep.; $0.25(OTS)
2028	10-3026	Dep.; $10.80(ph OTS); $3.90(mf OTS)
2031	10-3350	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2034	10-3186	Dep.; $0.25(OTS)
2035	10-3798	Dep.; $0.20(OTS)
2037	10-3211	Dep.; $4.80(ph OTS); $2.70(mf OTS)
2040	10-3177	Dep.; $0.20(OTS)
2047	10-3317	Dep.; $0.30(OTS)
2048	10-3282	pp.71-94 of "Nuclear Metallurgy—A Symposium on Behaviour of Materials in Reactor Environment, February 20, 1956." IMD Special Report Series No. 2. New York, American Inst. of Mining and Metallurgical Engineers, Inc., 1956. 94p. $3.75.
2050	10-3212	Dep.; $0.15(OTS)
2059	10-3268	Dep.; $1.80(ph OTS); $1.80(mf OTS)
2060	10-3768	Dep.(mc); $10.80(ph OTS); $3.90(mf OTS)
ORO		
125	10-3773	Dep.; $5.50(GPO)
136	10-83	Dep.; $0.15 (OTS)
139	10-763	Dep.; $1.00(OTS)
143	10-2062	Dep.; $0.15(OTS)
145	10-1169	Dep.; $0.65(OTS)
146	10-580	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
148	10-3341	Dep.; $0.25(OTS)
150	10-3769	Dep.; $0.65(OTS)
R		
52GL51	10-2405	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
116	10-3032	See NEVIS-16
[illegible]		
55	10-3290	Dep.; $0.20(OTS)
RL		
4.6.151	10-3495	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4.6.231	10-3565	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4.6.260	10-2393	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
4.6.265	10-2394	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4.6.271	10-3640	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4.6.321	10-2395	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
12.6.17	10-1267	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
16.6.49	10-3750	Dep.(mc); $13.80(ph OTS); $4.80(mf OTS)
28.5.109	10-2498	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
28.5.114	10-2547	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

Report	Abstract	Availability
RL		
28.5.117	10-3662	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
28.5.120	10-2451	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
28.5.121	10-2452	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
28.5.135	10-2241	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
28.5.139	10-2453	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
28.5.144	10-2454	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
28.5.146	10-2493	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
55-RL-1405	10-188	See SO-2523
56-RL-1485	10-3134	See SO-2044
56-RL-1521	10-3286	See SO-2045
55-RL-1530	10-3821	See SO-2046
RM		
1412-AEC		See AECU-3102
1556-AEC	10-1129	See AECU-3111
1578-AEC	10-1836	See AECU-3125
RME		
51	10-796	Dep.; $0.20(OTS)
58(Pt.I)	10-1350	Dep.; $0.25(OTS)
73	10-797	Dep.; $0.15(OTS)
75(Pt.1)	10-798	Dep.; $0.25(OTS)
76(Pt.1)	10-799	Dep.; $0.20(OTS)
77(Pt.1)	10-800	Dep.; $0.20(OTS)
79	10-2063	Dep.; $0.20(OTS)
80(Pt.I)	10-1351	Dep.; $0.20(OTS)
1044	10-1352	Dep.; $0.20(OTS)
1049	10-148	Dep.; $0.15 (OTS)
1059	10-801	Dep.; $0.20(OTS)
2015	10-1784	Dep.; $0.20(OTS)
2021	10-802	Dep.; $0.15(OTS)
2023	10-1353	Dep.; $0.25(OTS)
2024	10-1354	Dep.; $0.15(OTS)
2027	10-803	Dep.; $0.15(OTS)
2032(Pt.1)	10-1355	Dep.; $0.20(OTS)
3105	10-1356	Dep.; $0.45(OTS)
3106	10-149	Dep.; $0.50 (OTS)
3107	10-2064	Dep.; $0.25(OTS)
3110(Pt.1)	10-150	Dep.; $7.80 (ph OTS); $3.30 (mf OTS)
3110(Pt.III)	10-1785	Dep.; $0.70(OTS)
3112	10-1357	Dep.; $0.25(OTS)
3113	10-804	Dep.; $0.20(OTS)
3116	10-805	Dep.; $0.25(OTS)
3119	10-1358	Dep.; $0.55(OTS)
3125	10-3130	Dep.; $0.20(OTS)
4054	10-806	Dep.; $0.25(OTS)
RMO		
2021	10-65	Dep.; $1.80 (ph OTS); $1.80 (mf OTS)
2032	10-1294	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)

Report	Abstract	Availability
RMO		
2037	10-1295	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2038	10-1296	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
2039	10-1297	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2041	10-3113	Dep.; $0.40(OTS)
2501	10-2991	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2502	10-722	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2503	10-723	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2504	10-724	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2505	10-107	Dep.(mc); $4.80 (ph OTS); $2.70 (mf OTS)
2506	10-2015	Dep.; $0.20(OTS)
2507	10-2686	Dep.; $0.15(OTS)
2508	10-2035	Dep.; $0.15(OTS)
2509	10-2617	Dep.; $0.20(OTS)
2510	10-3114	Dep.; $0.20(OTS)
2512	10-3115	Dep.; $0.20(OTS)
2516	10-1767	Dep.; $0.20(OTS)
2517	10-2992	Dep.; $0.25(OTS)
2518	10-3342	Dep.; $0.30(OTS)
2519	10-2664	Dep.; $0.20(OTS)
2520	10-2687	Dep.; $0.20(OTS)
2522	10-2688	Dep.; $0.20(OTS)
2523	10-2689	Dep.; $0.20(OTS)
2525	10-2690	Dep.; $0.20(OTS)
2526	10-2036	Dep.; $0.15(OTS)
2527	10-2037	Dep.; $0.25(OTS)
2530	10-3343	Dep.; $0.25(OTS)
2531	10-3277	Dep.; $0.15(OTS)
2532	10-2665	Dep.; $0.30(OTS)
2607	10-725	Dep.; $0.25(OTS)
2611	10-2038	Dep.; $0.30(OTS)
2612	10-1298	Dep.; $0.20(OTS)
2616	10-1321	Dep.; $0.50(OTS)
2617	10-1299	Dep.; $0.25(OTS)
2709	10-2259	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2710	10-2260	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2715	10-2261	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2716	10-2262	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
2719	10-2263	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2720	10-2264	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2722	10-2265	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2724	10-2266	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2726	10-3418	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
4000	10-1300	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
4002	10-1301	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
SEP		
54	10-3818	Dep.; $0.20(OTS)
91	10-3819	Dep.; $0.15(OTS)
113	10-1815	Dep.; $0.30(OTS)
123	10-1816	Dep.; $0.25(OTS)
127	10-3362	Dep.; $0.30(OTS)

Report	Abstract	Availability
SEP		
149	10-3013	Dep.; $0.30(OTS)
184	10-854	Dep.; $0.25(OTS)
SO		
2043	10-996	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2044	10-3134	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2045	10-3286	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2046	10-3821	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2523	10-188	Dep.(mc); $4.80 (ph OTS); $2.70 (mf OTS)
3003	10-3613	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
3005	10-3614	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
Spec.		
49	10-3750	See RL-16.6.49
SR		
119	10-2797	See AECD-3726
SUI		
55-9	10-2097	Phys. Rev. 100, 1460-7(1955)
TEI		
336A	10-151	Dep.; $0.20 (OTS)
380	10-161	U. S. Geol. Survey Bull. 1021-C(1955); (GPO)
455	10-1786	Am. Mineralogist 40, 1004-21(1955)
462	10-2065	Dep.; $0.35(OTS)
472	10-821	Econ. Geol. 50, 447-58(1955)
479	10-152	Dep.; $0.30 (OTS)
507	10-2066	Dep.; $0.30(OTS)
515	10-3192	Dep.; $0.25(OTS)
540	10-2067	Dep.; $1.50(OTS)
TEM		
645	10-160	U. S. Geol. Survey Bull. 1009-H(1955); $0.40 (GPO)
693	10-157	Available from U. S. Geol. Survey, as Geologic Quadrangle Map GQ-61
695	10-158	Available from U. S. Geol. Survey, as Geologic Quadrangle Map GQ-68
696	10-1359	Available from U. S. Geol. Survey, as Geological Quadrangle Map GQ-55
697	10-154	Available from U. S. Geol. Survey, as Geologic Quadrangle Map GQ-59
698	10-155	Available from U. S. Geol. Survey, as Geologic Quadrangle Map GQ-69
700	10-156	Available from U. S. Geol. Survey, as Geologic Quadrangle Map GQ-66
874-A	10-3007	Dep.; $0.20(OTS)
917	10-153	Dep.; $0.15 (OTS)
TID		
3010(Suppl.2)	10-2726	Dep.; $0.30(OTS)
3043(Suppl.2)	10-502	Dep.; $0.25(OTS)
3044(Suppl.1)	10-2727	Dep.; $1.50(OTS)
3053	10-3053	Dep.; $0.35(OTS)
5047	10-3231	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

Report	Abstract	Availability
TID		
5048	10-3731	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5050	10-3232	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
5051	10-3233	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
5054	10-3042	Dep.; $0.35(OTS)
5055	10-3213	Dep.; $0.15(OTS)
5057	10-3234	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5097	10-3378	Dep.; $0.25(OTS)
5116	10-3363	Dep.; $1.00(OTS)
5117	10-885	Dep.; $0.25(OTS)
5140	10-3188	Dep.; $0.25(OTS)
5184	10-3014	Dep.; $0.60(OTS)
5212	10-1817	Dep.; $1.00(OTS)
5213	10-3162	Dep.; $1.15(OTS)
5214	10-3140	Dep.; $2.65(OTS)
5215	10-926	Dep.; $1.45(OTS)
5216	10-927	Dep.; $1.85(OTS)
5217	10-1863	Dep.; $2.65(OTS)
5218	10-938	Dep.; $1.85(OTS)
5219	10-3210	Dep.; $1.50(OTS)
5259	10-613	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
5280(Suppl. 1)	10-2024	Dep.; $0.60(OTS)
5292	10-2168	Dep.; $0.45(OTS)
5300	10-1520	Dep.; $1.75(GPO)
7001	10-1928	Dep.; $2.45(OTS)
7004	10-3318	$2.10(OTS)
7508	10-3790	Dep.; $0.40(OTS)
8001	10-1170	Dep.; $0.15(OTS)
8002	10-2579	Dep.; $0.20(OTS)
8003	10-3043	Dep.; $0.20
8004	10-3128	Dep.; $0.15(OTS)
8005	10-3179	Dep.; $0.15(OTS)
8006	10-3301	Dep.; $0.20
8007	10-3256	Dep.; $0.15(OTS)
8008	10-3169	Dep.; $0.15(OTS)
8009	10-3235	Nucleonics 14, No. 3, 45-7(1956)
8010	10-3876	Dep.; $0.45(OTS)
UCLA		
30	10-3351	Dep.; $0.25(OTS)
330	10-956	Am. J. Roentgenol. Radium Therapy Nuclear Med. 75, 1169-73(1956); Dep.; $0.20(OTS)
336	10-1693	Dep.; $0.25(OTS)
337	10-2973	J. Biol. Chem. 218, 911-19(1956)
343	10-581	Dep.; $0.20(OTS)
344	10-1329	Dep.; $0.15(OTS)
346	10-2	Dep.(mc); $4.80 (ph OTS); $2.70 (mf OTS)
347	10-507	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
348	10-517	Dep.(mc); OTS $4.80(ph OTS); $2.70(mf OTS)
349	10-554	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
350	10-555	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
351	10-508	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)

Report	Abstract	Availability
UCLA		
352	10-509	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
353	10-2993	Dep.; $0.20(OTS)
354	10-3834	Dep.; $0.25(OTS)
355	10-1153	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
356	10-2671	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
359	10-2967	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
360	10-3184	Dep.; $3.30(ph OTS); $2.40(mf OTS)
361	10-3328	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
363	10-3770	Dep.; $3.30(ph OTS); $2.40(mf OTS)
364	10-3776	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
365	10-3881	Dep.; $3.30(ph OTS); $2.40(mf OTS)
UCRL		
78	10-2353	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
96	10-2499	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS
111	10-2488	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
114	10-2551	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
116	10-3663	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
126	10-2332	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
130	10-3664	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
132	10-2500	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
139	10-2501	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
140	10-2502	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
184	10-2466	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
196	10-3566	Dep.(mc); $12.30(ph OTS); $4.50(mf OTS)
326	10-2354	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
633	10-2344	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
764	10-2333	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
861	10-3496	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
1173	10-1584	Dep.(mc); $28.80(ph OTS); $8.40(mf OTS)
1280	10-2503	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
1294	10-2334	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
2179(Suppl.)	10-2461	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
2589	10-1207	J. Am. Chem. Soc. 77, 5948-57(1955)
2672	10-1585	Dep.; $0.50(OTS)
2674	10-726	Dep.; $0.15(OTS)
2755	10-2031	J. Chem. Phys. 23, 1750-6(1955)
2797	10-1869	J. Chem. Phys. 23, 1629-30(1955)
2808	10-1090	Dep.; $0.45(OTS)
2816	10-2768	J. Chem. Phys. 23, 1826-9(1955)
2854(Rev.)	10-1896	Dep.; $1.80(ph OTS); $1.80(mf OTS)
2879	10-1859	Dep.; $0.35(OTS)
2884	10-1130	Dep.; $45.00(ph OTS); $11.10(mf OTS)
2933	10-261	Rev. Sci. Instr. 26, 954-8(1955)
2949	10-1862	Electronics 28, No. 11, 218-220(1955).
2950	10-454	Phys. Rev. 100, 137-42(1955)
2959	10-496	Phys. Rev. 100, 372-5(1955)
2980	10-2206	Phys. Rev. 100, 1403-6(1955)

Report	Abstract	Availability
UCRL		
2982	10-1632	Phys. Rev. 100, 905-11(1955)
2991	10-1524	Phys. Rev. 100, 844(1955)
3033	10-1081	Dep.; $4.80(ph OTS); $2.70(mf OTS)
3034	10-494	Phys. Rev. 100, 240-1(1955)
3041	10-285	Nuovo cimento (10), 2, 344-5(1955)
3053	10-2191	Phys. Rev. 100, 1445-7(1955)
3054	10-1126	J. Chem. Phys. 23, 1956-7(1955)
3072	10-1217	Dep.; $0.20(OTS)
3083	10-283	Phys. Rev. 100, 430-1(1955)
3084	10-1447	Dep.; $0.15(OTS)
3094	10-1467	Dep.; $0.55(OTS)
3098	10-490	Dep.; $19.80 (ph OTS); $6.30 (mf OTS)
3101	10-2185	Science 122, 1127-32(1955)
3115	10-1009	Dep.; $9.30(ph OTS); $3.60(mf OTS)
3132	10-582	Dep.; $4.80(ph OTS); $2.70(mf OTS)
3135	10-787	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
3136	10-919	Dep.; $4.80(ph OTS); $2.70(mf OTS)
3138	10-222	Dep.; $0.20(OTS)
3141	10-1154	Dep.; $1.80(ph OTS); $1.80(mf OTS)
3144	10-583	Dep.; $0.20(OTS)
3145	10-3	Proc. Soc. Exptl. Biol. Med. 90, 463-6 (1955)
3150	10-1586	Dep.; $0.20(OTS)
3153	10-1082	Dep.; $3.30(ph OTS); $2.40(mf OTS)
3154	10-1448	Dep.; $12.30(ph OTS); $4.50(mf OTS)
3156	10-979	Nuovo cimento (10) 3, 85-93(1956)
3157	10-1729	Dep.; $0.50(OTS)
3169	10-629	Dep.; $0.20(OTS)
3172	10-1510	Phys. Rev. 100, 947-50(1955)
3173	10-3204	Dep.; $0.25(OTS)
3176	10-1948	Dep.; $4.80(ph OTS); $2.70(mf OTS)
3178	10-1218	Dep.; $0.15(OTS)
3179	10-1468	Dep.; $1.80(ph OTS); $1.80(mf OTS)
3184	10-3045	Dep.; $0.25(OTS)
3185	10-1939	Dep.; $6.30(ph OTS); $3.00(mf OTS)
3187	10-1587	Dep.; $3.30(ph OTS); $2.40(mf OTS)
3190	10-2639	Dep.; $0.35(OTS)
3191	10-1694	Dep.; $0.25(OTS)
3195	10-3205	Dep.; $4.80(ph OTS); $2.70(mf OTS)
3203	10-2571	Dep.; $0.25(OTS)
3208	10-1696	Dep.; $6.30(ph OTS); $3.00(mf OTS)
3209	10-3116	Dep.; $10.80(ph OTS); $3.90(mf OTS)
3210	10-3031	Dep.; $0.15(OTS)
3211	10-3047	Dep.; $1.80(ph OTS); $1.80(mf OTS)
3212	10-2181	Dep.; $0.25(OTS)
3213	10-2628	Dep.; $12.30(ph OTS); $4.50(mf OTS)
3215	10-2103	Dep.; $3.30(ph OTS); $2.40(mf OTS)
3218	10-3046	Dep.; $6.30(ph OTS); $3.00(mf OTS)
3223	10-3222	Dep.; $7.80(ph OTS); $3.30(mf OTS)
[redacted]	10-2572	Dep.; $6.30(ph OTS); $3.00(mf OTS)
3236	10-3239	Dep.; $4.80(ph OTS); $2.70(mf OTS)
3237	10-3206	Dep.; $0.15(OTS)
[redacted]	10-3104	Dep.; $0.50(OTS)
3242	10-3098	Dep.; $0.25(OTS)
3247	10-3164	Dep.; $6.30(ph OTS); $3.00(mf OTS)
[redacted]	10-3240	Dep.; $0.30(OTS)
[redacted]	10-3878	Dep.(mc); $0.50(OTS)
3265	10-3791	Dep.; $1.80(ph OTS); $1.80(mf OTS)
[redacted]	10-3246	Dep.; $0.35(OTS)
3268	10-3165	Dep.; $0.40(OTS)
3271	10-3215	Dep.; $0.15(OTS)
3273	10-3241	Dep.; $6.30(ph OTS); $3.00(mf OTS)
3274	10-3303	Dep.; $12.30(ph OTS); $4.50(mf OTS)
3275	10-3846	Dep.; $3.30(ph OTS); $2.40(mf OTS)
3281	10-3320	Dep.; $10.80(ph OTS); $3.90(mf OTS)
[redacted]	10-3847	Dep.; $4.80(ph OTS); $2.70(mf OTS)
3288	10-3207	Dep.; $3.30(ph OTS); $2.40(mf OTS)
[redacted]	10-3848	Dep.; $0.15(OTS)
3291	10-3304	Dep.; $0.20(OTS)
[redacted]	10-3308	Dep.; $3.30(ph OTS); $2.40(mf OTS)
3295	10-3305	Dep.; $1.80(ph OTS); $1.80(mf OTS)
3314	10-3216	Dep.; $1.80(ph OTS); $1.80(mf OTS)
3317	10-3272	Dep.; $0.15(OTS)
3324	10-3792	Dep.; $0.15(OTS)
[redacted]	10-3854	Dep.; $0.30(OTS)
[redacted]	10-3772	Dep.; $3.30(ph OTS); $2.40(mf OTS)
[redacted]	10-2173	Dep.; $0.25(OTS)
[redacted]	10-382	Dep.; $1.80 (ph OTS); $1.80 (mf OTS)
4505	10-2239	Phys. Rev. 100, 1284-6(1955)
4506	10-2240	Phys. Rev. 100, 1286-93(1955)
4516	10-1872	Dep.; $4.80(ph OTS); $2.70(mf OTS)
4526	10-1125	J. Chem. Phys. 23, 1956(1955)
4531	10-893	Dep.; $1.80(ph OTS); $1.80(mf OTS)
4540	10-943	Dep.; $3.30(ph OTS); $2.40(mf OTS)
4547	10-236	Dep.; $0.20 (OTS)
4557	10-910	Dep.; $3.30(ph OTS); $2.40(mf OTS)
[redacted]	10-928	Dep.; $4.80(ph OTS); $2.70(mf OTS)
4560	10-1853	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
[redacted]	10-1412	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
[redacted]	10-3225	Dep.; $0.25(OTS)
[redacted]	10-3236	Dep.; $3.30(ph OTS); $2.40(mf OTS)
4628	10-3137	Dep.; $0.15(OTS)
4629	10-3287	Dep.; $0.15(OTS)
4641	10-3221	Dep.; $3.30(ph OTS); $2.40(mf OTS)
UCRL-Trans		
[redacted]	10-336	LC
[redacted]	10-277	JCL
[redacted]	10-1509	LC
[redacted]	10-1621	LC

Report	Abstract	Availability
UCRL-Trans		
253	10-2949	LC
[redacted]	10-3036	LC
UCSF		
12	10-3166	Dep.; $10.80(ph OTS); $3.90(mf OTS)
[redacted]R		
[redacted]	10-1983	Dep.; $6.30(ph OTS); $3.00(mf OTS)
[redacted]	10-19	Dep.; $3.30 (ph OTS); $2.40 (mf OTS)
302	10-1776	Dep.; $16.80(ph OTS); $5.70(mf OTS)
[redacted]	10-614	Dep.; $13.80(ph OTS); $4.80(mf OTS)
[redacted]	10-957	Dep.; $0.60(OTS)
[redacted]	10-545	Dep.; $18.30(ph OTS); $6.00(mf OTS)
[redacted]	10-2243	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
403	10-20	Brit. J. Radiol. 29, 169-71(1956)
[redacted]	10-4	Dep.; $7.80 (ph OTS); $3.30 (mf OTS)
411	10-548	Dep.; $3.30(ph OTS); $2.40(mf OTS)
414	10-556	Dep.; $3.30(ph OTS); $2.40(mf OTS)
415	10-1982	Dep.; $6.30(ph OTS); $3.00(mf OTS)
416	10-3257	Dep.; $3.30(ph OTS); $2.40(mf OTS)
417	10-3097	Dep.; $1.80(ph OTS); $1.80(mf OTS)
418	10-1984	Dep.; $3.30(ph OTS); $2.40(mf OTS)
421	10-3099	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
[redacted]	10-3096	Dep.; $3.30(ph OTS); $2.40(mf OTS)
423	10-3092	Dep.; $33.30(ph OTS); $9.60(mf OTS)
426	10-2974	Dep.; $1.80(ph OTS); $1.80(mf OTS)
[redacted]	10-3258	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
428	10-3100	J. Gen. Physiol. 39, 625-49(1956); Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
429	10-3259	Dep.; $3.30(ph OTS); $2.40(mf OTS)
430	10-3168	Dep.; $6.30(ph OTS); $3.00(mf OTS)
431	10-3260	Dep.; $1.80(ph OTS); $1.80(mf OTS)
433	10-3253	Dep.; $6.30(ph OTS); $3.00(mf OTS)
434	10-3255	Dep.; $4.80(ph OTS); $2.70(mf OTS)
440	10-3771	Dep.; $3.30(ph OTS); $2.40(mf OTS)
WAPD		
21	10-2467	Dep.(mc); $24.30(ph OTS); $7.50(mf OTS)
25	10-1399	
76	10-781	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
77	10-2194	Dep.; $0.20(OTS)
79	10-2918	Dep.; $0.25(OTS)
84	10-3615	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
128	10-3151	Dep.; $0.25(OTS)
129	10-2084	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
131	10-1822	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
134	10-3403	Dep.; $0.60(OTS)
146	10-3839	Dep.; $0.25(OTS)
WAPD-CE		
41	10-3877	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)

Report	Abstract	Availability
WAPD-MM		
538	10-3616	See AECD-3864
WAPD-SFR-Fe		
192	10-1823	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
WAPD-T		
20	10-3015	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
38 and Suppl.	10-3139	Dep.; $0.40(OTS)
WAPD-TN		
520	10-3237	Dep.; $4.80(ph OTS); $2.70(mf OTS)
521	10-195	Dep.(mc); $6.30 (ph OTS); $3.00 (mf OTS)
522	10-1562	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
[redacted]	10-3372	Dep.; $0.25(OTS)
WASH		
275	10-2610	Dep.; $1.50(OTS)
291(Pt-1)	10-3029	Dep.; $1.00(OTS)
292(Pt.3, Suppl.1)	10-1563	Dep.; $0.20(OTS)
WIAP-M		
18	10-3249	Dep.; $1.80(ph OTS); $1.80(mf OTS)
WIN		
2	10-3273	Dep.; $0.30(OTS)
3	10-1322	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
5	10-1323	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
6	10-66	Dep.(mc); $6.30 (ph OTS); $3.00 (mf OTS)
11	10-3799	Dep.; $0.20(OTS)
12	10-1302	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
13	10-727	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
17	10-3344	Dep.; $0.25(OTS)
18	10-1303	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
23	10-67	Dep.(mc); $6.30 (ph OTS); $3.00 (mf OTS)
24	10-728	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
25	10-587	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
Y		
1	10-2455	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
27	10-2477	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
32	10-2478	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
42	10-2570	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
63	10-3567	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
87	10-3568	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
112	10-3569	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
149	10-3473	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
161	10-3570	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
164	10-3625	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
184	10-3571	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)

Report	Abstract	Availability
Y		
228	10-3626	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
242	10-2473	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
243	10-2479	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
253	10-2335	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
286	10-3572	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
287	10-3627	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
299	10-3628	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
315	10-3573	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
321	10-2460	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
328	10-2336	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
352	10-3629	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
353	10-3630	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
381	10-3574	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
389	10-3737	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
390	10-3459	Dep.(mc); $9.30(ph OTS); $3.60(mf OTS)
407	10-3460	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
409	10-3575	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
411	10-2474	Dep.(mc); $7.80(ph OTS); $2.30(mf OTS)
414	10-3600	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
431	10-3182	Dep.; $0.25(OTS)
449	10-2994	Dep.; $0.15(OTS)
462	10-2267	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
463	10-2337	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
471	10-3580	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
475	10-2268	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
477	10-2995	Dep.; $0.30(OTS)
478	10-3576	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
544	10-3631	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
545	10-2475	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)

Report	Abstract	Availability
Y		
553	10-3135	Dep.; $0.20(OTS)
559	10-3793	Dep.; $0.25(OTS)
560	10-3274	Dep.; $0.40(OTS)
563	10-2476	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
573	10-3200	Dep.; $0.15(OTS)
589	10-3278	Dep.; $0.25(OTS)
602	10-3461	Dep.(mc); $4.80(ph OTS); $2.70(mf OTS)
611	10-2996	Dep.; $0.20(OTS)
612	10-3794	Dep.; $0.25(OTS)
652	10-3632	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
655	10-3633	Dep.(mc); $1.80(ph OTS); $1.80(mf OTS)
817	10-3820	Dep.; $0.30(OTS)
824	10-3016	Dep.; $0.25(OTS)
883	10-615	Dep.(mc); $3.30(ph OTS); $2.40(mf OTS)
1052	10-2736	Dep.; $0.20(OTS)
1087	10-2046	Dep.; $0.20(OTS)
1095	10-616	Dep.; $4.80(ph OTS); $2.70(mf OTS)
1096	10-84	Dep.; $0.15 (OTS)
1114	10-3027	Dep.; $0.25(OTS)
Y-B		
58-1	10-3581	See AECD-3901
Y-F		
10-112	10-3665	See AECD-3994
Z		
12	10-3686	See CF-46-6-23

PART II

ACSIL/ADM (British)		
50/249	10-1838	See ARL/R3/E600
AD (Non-AEC)		
2178	10-2731	See WADC-TR-52-289
13795	10-563	See BM-3289
28714	10-756	
33351	10-584	See WADC-TR-52-5(Suppl.2)
35659	10-823	
36320	10-2069	
36901	10-2732	See WADC-TR-53-510(Pt.I)
37021	10-2613	See ERI-1966-1-P
37256	10-141	
37474	10-835	See CAL-KA-797-M-10
37740	10-824	
37749	10-1099	
38637	10-124	
39372	10-187	See S and T Memo-8/54

AD (Non-AEC)		
39616	10-883	
[illegible]	10-825	
[illegible]	10-559	
40079	10-875	See TIB/T4119
40762	10-784	
40932	10-760	
41197	10-826	
41212	10-186	See PIBAL-254
41213	10-185	See PIBAL-252
41565	10-842	See NBTL-T-R-89
41807	10-318	
43730	10-172	
45691	10-2700	See WADC-TR-54-194
[illegible]	10-1752	
49021	10-191	See WADC-TR-53-477
[illegible]	10-790	See WADC-TR-54-38

AD (Non-AEC)

Report	Abstract	Availability
50566	10-764	See WADC-TR-54-66
51791	10-2735	See WCRT-TN-54-51
53654	10-1268	See WADC-TR-53-457
58607	10-132	See WADC-TR-53-288(Pt.6)
59634	10-674	See T-146-R
59789	10-827	
59791	10-53	
59979	10-785	
62227	10-572	See JPL-PR-20-219
62517	10-2782	
63502	10-1392	See WADC-TR-53-190(Pt.3)
63615	10-894	See WADC-TR-54-38(Pt.2)
63962	10-1395	See WADC-TR-54-588
66412	10-828	
66441	10-585	See WADC-TR-52-5(Suppl.3)
67096	10-2693	
68680	10-2713	
69092	10-2766	

AECL (Canadian)

Report	Abstract	Availability
163	10-628	See CRE-374
219	10-339	Can. J. Phys. 33, 607-8(1955)
230	10-202	See CRCE-608
232	10-375	See DR-32
235	10-1769	Can. J. Chem. 33, 1775-9(1955)
236	10-1770	Can. J. Chem. 33, 1780-91(1955)
240	10-2882	$1.00
241	10-1411	See PR-P-27
242	10-504	
243	10-1949	Can. J. Phys. 33, 886-8(1955)
252	10-1551	See DL-20
254	10-505	$0.25
255	10-1852	Can. J. Phys. 33, 889-91(1955)
257	10-2898	Can. J. Phys. 34, 20-3(1956)
259	10-1923	$0.25
262	10-2870	Can. J. Phys. 34, 147(1956)
263	10-1977	See DL-21
265	10-2164	See DL-19

AERE-C/M (British)

Report	Abstract	Availability
260	10-2643	Dep.

AERE-C/R (British)

Report	Abstract	Availability
1502	10-2926	Dep.
1637	10-605	
1646	10-248	$1.15
1699	10-458	J. Inorg. and Nuclear Chem. 1, 241-7(1955)
1709	10-500	J. Inorg. and Nuclear Chem. 1, 248-52(1955)
1715	10-1547	$3.50
1725	10-1232	Dep.; $0.65
1735	10-1256	Dep.
1749	10-1233	$0.90
1757	10-2650	

AERE-CE/R (British)

Report	Abstract	Availability
1730	10-1271	$1.00

AERE-E/R (British)

Report	Abstract	Availability
173	10-126	$0.90

AERE-EL/M (British)

Report	Abstract	Availability
92	10-946	$0.65

AERE-EL/R (British)

Report	Abstract	Availability
1507	10-249	
1555	10-2197	Brit. J. Appl. Phys. 6, 444-9(1955)
1676	10-921	

AERE-GP/M (British)

Report	Abstract	Availability
182	10-761	

AERE-GP/R (British)

Report	Abstract	Availability
1613	10-1074	
1742	10-1582	Dep.
1748	10-2903	

AERE-HP/M (British)

Report	Abstract	Availability
95	10-110	Atomics 6, 312-20(1955)

AERE-I/R (British)

Report	Abstract	Availability
1369	10-143	J. Sci. Instr. 32, 394-8(1955)

AERE-INF/Bib (British)

Report	Abstract	Availability
93(3rd Ed.)	10-2699	Dep.

AERE-Lib/Trans (British)

Report	Abstract	Availability
443	10-205	
489	10-1432	
521	10-2009	Dep.
528	10-1244	Dep.
533	10-2771	
547	10-1433	Dep.
548	10-334	
555	10-2707	
557	10-230	
559	10-1978	
563	10-196	
564	10-1434	Dep.
567	10-2711	Dep.
569	10-335	
570	10-1521	Dep.
575	10-422	
579	10-1338	Dep.
582	10-1590	Dep.
585	10-2227	Dep.
587	10-2818	Dep.
588	10-2819	Dep.
591	10-2694	
599	10-276	
601	10-1152	

Report	Abstract	Availability
AERE-Lib/Trans (British)		
606	10-2692	Dep.
610	10-2908	Dep.
617	10-2049	Dep.
621	10-2772	Dep.
625	10-2943	Dep.
629	10-2802	Dep.
1484	10-1156	
AERE-M/M (British)		
99	10-830	
AERE-M/R (British)		
649	10-776	
AERE-NP/R (British)		
1720	10-250	$0.90
AERE-RP/R (British)		
1447	10-1064	J. Nuclear Energy 2, 52-8(1955)
AERE-RS-L (British)		
3	10-2187	$0.75
AERE-T/M (British)		
128	10-1075	Dep.
AERE-T/R (British)		
1367	10-947	
1617(Del.)	10-1086	
1718	10-2051	Proc. Roy. Soc. (London) A233, 367-76 (1955) (Condensed)
AERE-X/R (British)		
1771	10-1583	Dep.
AF-SAM (Non-AEC)		
55-45	10-1717	
55-94	10-1173	Arch. Opthalmol. 54, 863-74(1955)
AF-TR (Non-AEC)		
6519(Pt.IV)	10-1347	
AFSWP (Non-AEC)		
798	10-1097	See USNRDL-453
905	10-1846	See USNRDL-TR-61
AGC (Non-AEC)		
1229-5	10-54	
1229-6	10-2670	
AMRL (Non-AEC)		
206	10-41	
ANL-GRH		
16	10-2648	See AECU-3142
ARC (British)		
1951	10-785	See AD-59979
ARL/R (British)		
3/E600	10-1838	
ATC (Non-AEC)		
54-12	10-1150	
ATI (Non-AEC)		
156652	10-584	See WADC-TR-52-5 and WADC-TR-52-5 (Suppl.1)
52341	10-174	
63671	10-145	See BIOS-FR-896
203413	10-1366	
AWRE (British)		
0-12/55	10-1754	
AWRE-O (British)		
14/55	10-1234	
20/55	10-1462	
BAC		
02-978-010	10-127	
BIOS-FR (British)		
[redacted]	10-145	
[redacted]		
[redacted]	10-563	
BM-IC (Non-AEC)		
7725	10-1616	
BM-RI (Non-Project)		
5141	10-175	
5168	10-607	
5170	10-1808	
BWR (British)		
5	10-1031	
CAL-KA (Non-AEC)		
797-M-10	10-835	
CCC (Non-AEC)		
1024-TR-107	10-232	
1024-TR-136	10-56	
1024-TR-139	10-57	
1024-TR-140	10-58	
1024-TR-141	10-59	

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CCC (Non-AEC)		
1024-TR-142	10-118	
1024-TR-143	10-60	
1024-TR-147	10-564	
1024-TR-148	10-565	
1024-TR-150	10-1210	
1024-TR-152	10-1211	
1024-TR-157	10-1212	
1024-TR-162	10-2611	
1024-TR-163	10-2612	
CERN (European)		
55-18	10-201	
55-23	10-411	Nuovo cimento (10) 2, Suppl. 1, 375-91 (1955)
55-24	10-412	Nuovo cimento (10) 2, Suppl. 1, 392-402 (1955)
55-27	10-1541	Kol. Danske Videnskab. Selskab, Mat.-Fys. Medd. 29, No. 19, 1955.
55-28	10-1515	Kgl. Danske Videnskab. Selskab, Mat.-fys. Medd. 30, No. 1, 1955. 24p.
55-30	10-1514	Kgl. Danske Videnskab. Selskab, Mat.-fys. Medd. 29, No. 16, 1955. 69p.
56-3	10-366	Phys. Rev. 100, 432-3(1955)
CERN-PS/A-SCH (European)		
2	10-2179	
43	10-1935	
CERN-PS/ER (European)		
42	10-407	
CERN-PS/FG (European)		
2	10-408	
CERN-PS/LRF (European)		
1	10-233	
CERN-PS/MM (European)		
21	10-1076	
20	10-409	
22	10-1077	
CERN-PS/PL (European)		
5	10-1078	
CERN-PS/RGB (European)		
8	10-922	
CERN-PS/RH (European)		
9	10-1458	
CRCE (Canadian)		
608	10-202	
CRE (Canadian)		
374	10-628	

Report	Abstract	Availability
CRRP (Canadian)		
[redacted]	10-2885	
CU (Misc.)		
2-55-ORD-1420-Met.	10-867	See WAL-401/149-20
DL (Canadian)		
19	10-2164	$1.00
20	10-1551	$0.25
21	10-1977	$0.50
DR (Non-AEC)		
[redacted]	10-375	
EES (Non-AEC)		
4C(8)17X1603	10-1809	
ERI (Non-AEC)		
1943-4-41-T	10-2025	See AECU-3077
1943-7-51-P	10-1162	See COO-210
1966-1-P	10-2613	
2189-1-T	10-484	See OSR-TN-55-184
FSE		
9-007	10-2895	See NARF-55-83T
G		
17-55	10-1366	See ATI-203413
GEAP		
0500	10-2717	
IGC-XMPDC/P (British)		
12	10-1371	See IGR-TN/C-250
IGC-XMWP/P (British)		
[redacted]	10-1371	See IGR-TN/C-250
IGR-R/R (British)		
151	10-1055	
IGR-TN/C (British)		
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JENER (Norwegian)		
37	10-2167	
[redacted]	10-1319	
JPL-PR (Non-AEC)		
20-219	10-572	
KLO		
132	10-3123	See K-434
MAB (Non-AEC)		
101-M	10-177	

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MCC (Non-AEC)		
1023-TR-162	10-573	
1023-TR-164	10-574	
1023-TR-169	10-1721	
1023-TR-170	10-1722	
1023-TR-174	10-1723	
1023-TR-177	10-1724	
1023-TR-178	10-1725	
ML		
274	10-1079	
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30	10-547	
MR-N (Non-AEC)		
30	10-1464	See NARF-55-77T
96	10-950	See NARF-55-45T
100	10-951	See NARF-55-67T
101	10-1101	See NARF-55-68T
104	10-1858	See NARF-55-72T
NACA-RM		
E51G12	10-234	
865	10-2075	
NACA-TM (Non-AEC)		
1147	10-767	
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NACA-TN (Non-AEC)		
[redacted]	10-778	
3552	10-2721	
[redacted]	10-2076	
[redacted]	10-2722	
NARF (Non-AEC)		
55-45T	10-950	
55-67T	10-951	
55-68T	10-1101	
55-72T	10-1858	
55-77T	10-1464	
55-83T	10-2895	
NBTL-T-R (Non-AEC)		
89	10-842	
NCSC (Non-AEC)		
108	10-1557	
109	10-2814	
124	10-2896	
NDA (Misc.)		
14	10-332	
14-24	10-1496	

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14-46	10-1559	
14-58	10-1560	
14-71	10-1497	
14-84	10-1561	
15C-53	10-312	See NYO-6268
NEI (Canadian)		
51	10-2897	
NM (Non-AEC)		
006-012.04.74	10-1164	
006-012.04.81	10-514	
006-012.04.82	10-16	
006.012.05.12	10-1165	
NNES-I		
10	10-3140	See TID-5214
13	10-3162	See TID-5213
NOL-CORONA		
143	10-2751	
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252	10-2752	
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4859(Suppl.7)	10-2093	
4963(Suppl.)	10-953	
5056(Del.)	10-2626	
5057(Del.)	10-2626	
[redacted]	10-1059	
5778	10-203	
5779	10-120	
5780	10-64	
[redacted]	10-178	
[redacted]	10-179	
[redacted]	10-251	
[redacted]	10-180	
[redacted]	10-181	
5791	10-221	
5792	10-17	
[redacted]	10-18	
[redacted]	10-575	
5795	10-795	
[redacted]	10-786	
5797	10-762	
[redacted]	10-843	
5799	10-737	
5801	10-954	
5802	10-844	

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5803	10-1116	
5804	10-889	
5805	10-1117	
5806	10-890	
5807	10-738	
5809	10-635	
5810	10-845	
5811	10-576	
5812	10-846	
5813	10-847	
5815	10-536	
5816	10-923	
5818	10-783	
5819	10-1373	
5820	10-848	
5822	10-1166	
5823	10-1465	
5824	10-1507	
5825	10-1374	
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5836	10-1381	
5837	10-1811	
5839	10-1812	
5840	10-1775	
5841	10-1813	
5842	10-1727	
5843	10-1896	
5844	10-2109	
5846	10-1840	
5848	10-2172	
5850	10-2078	
5851	10-2079	
5852	10-2704	
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5860	10-2758	
5861	10-2616	
5864	10-2723	
5866	10-2724	
5867	10-2789	
NPG		
126	10-1151	Dep.; $0.45(OTS)

Report	Abstract	Availability
NRC (Canadian)		
3767	10-1847	Can. J. Phys. 33, 746-56(1955)
3805	10-2759	Can. J. Phys. 34, 1-19(1956)
NRL (Non-AEC)		
4536	10-577	
4545	10-182	
4546	10-891	
4597	10-849	Welding J. (N. Y.) 35, 9s-17s(1956)
4607	10-2592	
4608	10-1080	
4623	10-850	
4640	10-1088	Phys. Rev. 101, 684-8(1956)
4643	10-1871	
4650	10-1382	
4654	10-1704	Science 123, 619-22(1956)
4666	10-2146	
4673	10-2858	
4677	10-2725	
4679	10-2627	
4680	10-2815	
4686	10-2644	
NRL-Trans (Non-AEC)		
456	10-197	
OSR-TN (Non-AEC)		
54-305	10-1845	pp.72-9 of "Proceedings of the National Science Foundation Conference on Stellar Atmospheres," held at Indiana Univ. Sept. 30, Oct. 1 and 2, 1954
55-184	10-484	
55-320	10-1014	See AECU-3104
55-447	10-2147	
55-479	10-2767	
OSR-TR (Non-AEC)		
55-23	10-852	
PDB (Canadian)		
139	10-106	
PIBAL (Non-AEC)		
252	10-185	
254	10-186	
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11	10-2904	
PR-P (Canadian)		
27	10-1411	
PRL (Non-AEC)		
5.16	10-892	

Report	Abstract	Availability
PWAC (Non-AEC)		
133	10-131	
RDB(R) (British)		
8150	10-1060	
RL		
55-1260	10-853	
RM (Misc.)		
1543(RAND)	10-2783	
1551(RAND)	10-1089	
1554	10-2784	
RSA/OML (Non-AEC)		
2	10-2109	See NP-5844
S and T Memo (British)		
8/54	10-187	
ST-RDS (Non-AEC)		
5	10-954	See NP-5801
SWP/P (British)		
21(Del.)	10-1086	See AERE-T/R-1617(Del.)
T		
146-R	10-874	
TIB/T (Non-AEC)		
4119	10-875	
TML (Non-AEC)		
7	10-856	
8	10-1818	J. Metals 8, 35-42(1956)
15	10-189	
18	10-857	
19	10-1387	
20	10-1388	
21	10-1389	
22	10-1819	
24	10-1820	
25	10-2728	
27	10-2729	
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132/55	10-1465	See NP-5823
130/55	10-795	See NP-5795
TT (Canadian)		
554	10-768	NRC
556	10-876	NRC
558	10-1132	NRC
560	10-808	NRC

Report	Abstract	Availability
TT (Canadian)		
561	10-589	NRC
571	10-2619	NRC
USBM-U (Non-AEC)		
3	10-1390	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
42	10-858	Dep.(mc); $7.80(ph OTS); $3.30(mf OTS)
57	10-859	Dep.(mc); $6.30(ph OTS); $3.00(mf OTS)
USNRDL (Non-AEC)		
450	10-503	
453	10-1097	
USNRDL-TR (Non-AEC)		
56	10-21	
57	10-22	
58	10-518	
59	10-537	Cancer Research 16, 258-61(1956)
60	10-779	
61	10-1846	
62	10-1241	
64	10-1189	Radiation Research 4, 186-92(1956)
65	10-2817	
66	10-1697	
WADC-PR		
55-1	10-739	
WADC-TR (Non-AEC)		
52-5	10-584	
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52-5(Suppl.2)	10-584	
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53-4(Suppl.1)	10-190	
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52-197(Pt.5)	10-1750	
53-287	10-788	
53-288(Pt.6)	10-132	
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53-510(Pt.I)	10-2732	
54-33	10-789	
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54-45	10-860	
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54-101(Pt.2)	10-861	
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54-194	10-2700	

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54-305(Pt.II)	10-1393	
54-352	10-2790	
54-414	10-791	
54-485(Pt.II)	10-862	
54-487	10-1394	
54-492	10-863	
54-580	10-2645	
54-582	10-142	
54-588	10-1395	
54-601	10-929	
55-5	10-1396	
55-22	10-864	
55-23	10-1397	
55-26(Pt.II)	10-1219	
55-90	10-1730	
55-96	10-865	
55-102(Pt.2)	10-1780	
55-111	10-192	J. Metals 8, 178-84(1956)
55-112	10-2733	
55-193(Pt.II)	10-2020	
55-205	10-2083	
55-501	10-2730	
WAL (Non-AEC)		
120/73-1	10-1242	
310/90-85	10-1821	
401/149-20	10-867	
401/227	10-193	
401/237	10-194	
401/241	10-1398	
401/244	10-2734	
401/245	10-627	
WAPD-TN (Misc.)		
517(Pt.II)	10-313	
WCRT		
54-51	10-2735	
WHC(C)/P (British)		
38	10-1060	See RDB(R)/8150
53	10-1055	See IGR-R/R-151
WIS-ONR (Non-AEC)		
16	10-245	
XAC-R		
188	10-3530	See AECD-3897

NEW NUCLEAR DATA

Compiled by the Nuclear Data Group, National Research Council
Washington 25, D. C.

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INTRODUCTION

This issue of Nuclear Science Abstracts contains the 1956 semi-annual list of new nuclear data. Additional summaries will follow in Volume 10, Nos. 18B and 24B. No. 18B will contain a quarterly list and No. 24B the annual cumulation for 1956. The 1952, 1953, 1954, and 1955 annual cumulations are contained in Vol. 6, No. 24B; Vol. 7, No. 24B; Vol. 8, No. 24B; and Vol. 9, No. 24B, respectively. Extra copies for 1952, 1953, and 1954 are exhausted; for 1955 they are obtainable for $0.60 from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Literature coverage is continuous; beginning in each new list where it ended in the last

Nuclear Data Cards: As the current literature is surveyed, the new nuclear results are first printed on 3- by 5-inch cards which are collected into sets of about 150 cards each month. Individuals, laboratories, or libraries may subscribe to the card sets directly by applying to the Publications Office, National Research Council, 2101 Constitution Avenue, N. W., Washington 25, D. C. The price, based on actual mechanical costs, is currently $20 per year domestic and $30 per year foreign(air mail postage included for foreign but not for domestic subscriptions.)

Nuclear Level Schemes: The first section of a new comprehensive nuclear data table prepared by the Nuclear Data Group was published last fall by the Government Printing Office. The aim of Nuclear Level Schemes is to provide a revision and expansion of Nuclear Data which was

issued in 1950 as Circular 499 of the U. S. National Bureau of Standards. It will be published in five or six sections, each one of which will be issued upon completion. The first section, now available, gives the data for known nuclei with mass numbers between A = 40 and A = 92, thus covering roughly the elements $_{20}$Ca through $_{40}$Zr. The second section will summarize the information for the next 20 elements, the third for 20 more, and so on.

The style of presenting data in Nuclear Level Schemes is very similar to that used on the Nuclear Data Cards and in the cumulated lists of Nuclear Science Abstracts. The cards, or the lists, will thus provide a convenient means of keeping this table up to date.

Nuclear Level Schemes (A = 40 to A = 92), TID-5300, can be ordered from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Price $1.75, 240 pages paperbound. Remittance should be by check or money order. Add 25% for foreign postage.

CONVENTIONS

All energies are given in Mev and all cross sections in barns unless otherwise stated in the tabular material.

Numerals in italics, following measured values, are the errors (as reported by the authors) in the last figure of the values. In cases where confusion seems possible, the conventional ± is used.

Magnetic moments are reported as before without diamagnetic correction. They are based on μ(H) = 2.79267 and the substandards listed by H. Walchli, ORNL-1469.

In writing reactions, the upper right hand superscript denoting A, the mass number of the target nucleus, is given without parentheses when the target was monoisotopic or when enriched (or depleted) material was used to establish the identity of the reacting isotope. It is given in parentheses when natural material was used and when the identity of the reacting isotope was strongly suggested by its predominating abundance, the observed reaction energy, or the activity or yield of the end product. It is given in parentheses with a question mark when the target A was assigned by systematics, elimination, etc. For instance, "B^{10}(d,p)" means that the proton groups from the deuteron bombardment of B^{10} were identified by comparing effects in B^{10} enriched and natural B samples. "B^{11}(d,p)" means that the assignment to B^{11} was made by using B^{11} depleted and natural B samples. "$C^{(12)}$(d,p)" means that natural C was used to study the reaction, but, because of the 99% abundance of C^{12}, the reaction observed was assumed to take place in that isotope. In the reaction "$Sn^{(116)}$(n,p)13^{s}In," the Sn isotope was identified by the In product. "$Te^{(125?)}$(d,p)$Te^{(126?)}$" indicates that from the trend of Q values in the region, the experimenters believed that their measured Q most likely belonged to the indicated reaction.

When a method of production of a radioactive nucleus is given, the lowest bombarding energy used by the experimenter is indicated; e.g., Ag(20-Mev p,n).

The large black dots on the decay schemes are used to indicate experimentally established coincidences. α, β, or γ rays entering a level and dotted at their arrowheads have been shown to be in coincidence with gamma rays leaving the same level and dotted at their origins. In case of a simple cascade, the dots of the incoming and outgoing rays are superimposed. Dashes are used for doubtful radiations or levels.

For the light nuclei, energy levels in the compound nucleus are usually tabulated rather than the resonant energy of the bombarding particle. The binding energy of the bombarding particle in the compound nucleus is taken from the table of F. Ajzenberg, T. Lauritsen, Revs. Modern Phys. 27, 77(1955) for Z < 11 and from P. M. Endt, J. C. Kluyver, Revs. Modern Phys. 26, 95(1954) for Z from 11 to 20.

ABBREVIATIONS

a	absorption
a $\beta\gamma$	absorption of β's in coincidence with γ's
a ce	absorption of conversion electrons
a coin	absorption of photoelectrons between counters in coincidence
act	neutron detection by activation (Mn, Rh, Ag, . . .)
α	total γ-ray conversion coefficient, N_e/N_γ
$\alpha_K, \alpha_L, \ldots$	γ-ray conversion coefficient for electrons ejected from the K, L, . . . shell
$\alpha_0, \alpha_1, \ldots$	α to g.s., first excited state, . . . of residual nucleus
B	band spectra method
B(E2)	reduced E2 excitation probability in barns^2 (upward transition)
Be(γ,n)	measurement by detection of photoneutrons from Be
BF_3	boron trifluoride neutron counter
B_n, B_p	neutron, proton binding energy, i.e., energy necessary to remove particle from nucleus
$\beta\gamma$ ($\perp$)	polarization-direction correlation of β's and γ's in coincidence
$\beta\gamma(\theta)$	angular correlation of β's and γ's in coincidence
calc	calculated from experimental work reported elsewhere
cc	cloud chamber
CcW	Cockcroft Walton accelerator
ce	conversion electrons
chem	chemical separation of product following reaction
Cp	Compton
crit a	critical absorption
cryst	crystal spectrometer
cyc	cyclotron
d	(1) deuteron, (2) descendant of, (3) days, when used as superscript
D	double resonance method
d,p(θ)	angular distribution of protons with respect to deuteron beam
D(γ,n),D(γ,p)	measurement by detection of photoneutrons or photoprotons from deuterium
$\bar{E}$	average energy
E_0	resonance energy
$E_\beta, E_\gamma, \ldots$	energy of β ray, energy of γ ray, . . .
E_{dis}	disintegration energy
EA	electrostatic analyzer
E1,E2, . . .	electric dipole, electric quadrupole, . . .
E_ϵ	energy of the electron capture transition (end point of γ continuum + K binding energy)
e_A	Auger electron
e_{AK}, e_{AL}	KXY, LXY Auger electron
el	elastic scattering
ϵ	electron capture
ϵB(E2)	partial B(E2) for radiation studied (photon, ce_K, or ce_L)
ϵ_K, ϵ_L	electron capture from K, L shell
$\eta(\theta)$	$[W(\theta) - W(\pi/2)]/W(\pi/2)$, a measure of asymmetry in angular distributions, where $W(\theta)$ is the count at angle θ
f	fission
F-K	Fermi-Kurie plot
ft	comparative half-life in the Fermi theory of β decay calculated for an allowed transition. Superscript 1, 2, or 3 on *f* indicates that comparative half-life is calculated for a unique 1st, 2nd, or 3rd forbidden transition.
g	(1) gyromagnetic ratio (2) statistical weight factor, $\frac{1}{2}[1 \pm 1/(2J+1)]$, in g Γ_n
Γ	resonance half-width (the whole width at half-maximum)
Γ_γ, Γ_n	partial resonance half-width for γ, neutron emission
$\gamma^\pm$	annihilation radiation
γ continuum	continuous γ spectrum associated with electron capture
$\gamma(Hg^{198})$	γ is emitted from nucleus in parentheses rather than from radioactive parent
$\gamma(\theta,T)$	γ intensity as function of angle and temperature
$\gamma\gamma$, $\beta\gamma$, $\alpha\gamma$, nγ	$\gamma\gamma$, $\beta\gamma$, $\alpha\gamma$, or nγ concidences. (0.123 γ) (0.246 γ, 0.325 γ) means 0.123 γ in coincidence with 0.246 γ and 0.325 γ
$\gamma\gamma(\theta)$	angular correlation of γ's in coincidence
$\gamma\gamma(\perp)$	polarization-direction correlation of γ's in coincidence

GM	Geiger-Müller counter
g.s.	ground state
h	hours
I	nuclear induction method
IB	internal bremsstrahlung
ic	ionization chamber
IT	isomeric transition
J	spin in units $h/2\pi$
K/L, K/LM	α_K/α_L, $\alpha_K/(\alpha_L + \alpha_M)$
L_1L_2/L_3	$(\alpha_{L_1} + \alpha_{L_2})/\alpha_{L_3}$
l	orbital angular momentum
Lin	linear accelerator
m	(1) medium intensity, (2) minutes, when used as a superscript
M	molecular or atomic beam resonance method
M1,M2, ...	magnetic dipole, magnetic quadrupole, ...
mb	millibarns
Mev	million electron volts (10^6 ev)
mev	millielectron volts (10^{-3} ev)
Mic	microwave method
mir	measurement by total reflection of neutron beam from mirror surface
mod cyc	modulated cyclotron
ms	(1) milliseconds, 10^{-3s} (2) mass spectrometer
$m\mu s$	millimicroseconds, 10^{-9s}
μ	nuclear magnetic moment (nuclear magnetons)
μ_3	nuclear magnetic octopole moment (nuclear magneton barns)
μs	microseconds, 10^{-6s}
$\mu\mu s$	micromicroseconds, 10^{-12s}
n res	known resonance of a "standard" element used to identify an unknown neutron energy
ν	neutrino
osc	pile oscillator method
p	(1) proton, (2) predecessor of
para	paramagnetic resonance method
parentheses	parentheses are put around values which are given for identification purposes
pc	proportional counter
pe	photoelectrons
ppl	photoplates or emulsions
pr	electron-positron pair
p res	proton resonance. Magnetic field standardized by means of proton resonance frequency
primes	primes indicate inelastically scattered particles
q	electric quadrupole moment in units of barns
quad res	quadrupole resonance method
q_4	nuclear electric 16-pole moment in units of 10^{-48} cm^4
Q	reaction energy in Mev
R	nuclear radius in fermis (10^{-13} cms)
s	(1) spectrometer method, (2) seconds, when used as superscript
s coh	coherent scattering
S	atomic spectra measurement
scin	1-crystal scintillation counter
scin Cp	2-crystal scintillation counter
scin pr	3-crystal scintillation counter
sd	double focusing spectrometer
sl	lens spectrometer
sl ce	conversion electrons measured in lens spectrometer
st	strong
$s\pi$	180° spectrometer
$s\pi$ pr	180° pair spectrometer
σ	cross section in barns
σ_0	cross section at resonance energy, E_0
σ_a	absorption cross section
σ_t	total cross section
Σpc	proportional counter used to sum energy of transitions in cascade
Σscin	scintillation counter used to sum energy of transitions in cascade
t	(1) triton, H^3, (2) total cross section when used under σ in cross section list
T	(1) isotopic spin, (2) temperature
τ	half life in units indicated
τ_1,τ_2	half life of upper, lower state
$\tau_{\beta\beta},\tau_{\epsilon\epsilon}$	half life for double β, double ϵ decay
th	thermal
trans	transmission
VdG	Van de Graaff accelerator
w,vw	weak, very weak
x	x radiation
y	years
Y_γ, Y_p, ...	yield of γ rays, yield of protons, ...
%	number per 100 disintegrations. For γ's, total number of photons plus ce's is meant
†	number relative to other numbers marked †. For γ's, number of photons only is meant
+,−	even, odd parity when used in connection with level properties

Standard journal abbreviations are used.

1. RADIOACTIVITY, LEVELS, ABUNDANCES, MOMENTS

n^1 (0 1)

μ -1.913150 M
$\nu(n)/\nu(p) = 0.685057$ *16*

N.R.Corngold, V.W.Cohen, N.F.Ramsey, Bull. Am. Phys. Soc. 1, No. 1, 11, B7 (1956).

n^1 (0 1) 12^m

β^- sl for β's from $p\beta(145° < \theta < 175°$,
$p\beta^-(E_\beta)$ consistent with $g_T^2/g_S^2 = 1.49\ ^{+1.44}_{-0.56}$

J.M.Robson, Phys. Rev. 100, 933 (1955).

n^1 (0 1)

Neutron electron interaction
$V = -4120 \pm 300$ ev (range $= e^2/mc^2$) from transmission in liquid Bi, $E_n = 0.1$ to 10 ev

E.Melkonian, B.M.Rustad, W.W.Havens, Jr., Bull. Am. Phys. Soc. 1, No. 1, 62, UA8 (1956); verbal report.

H^3 (1 2) 12^y

τ 12.262^y 4 He^3 growth

W.M.Jones, Phys. Rev. 100, 124 (1955).

H^4 (1 3)

$C^{(12)}(300,\ 430\text{-Mev p})$
No evidence for β emitter, $E_\beta > 12$, $\tau = 1$ to 10^{ms}
$\sigma(\tau = 2$ to $4^{ms}) < 10^{-6}$ a, delay
$\sigma(\tau = 4$ to $10^{ms}) < 10^{-5}$

A.A.Reut, S.M.Korenchenko, V.V.Yur'ev, B.M. Pontecorvo, Doklady Akad. Nauk SSSR 102, 723 (1955); AERE Lib/Trans. 600.

He^4 (2 2)

Level $H^3(p,n)$ $E_p = 1.4$ to 6.8
100^* 22 $J = 2^-$ p,n(θ); BF_3
σ has broad max at $E_p = 3$. Large $\int d\sigma$ at max (0.58) implies $J = 2$. Increase with E_p of asymmetry in p,n(θ) suggests 1^- level at >25
*Peak $\sigma(0°)$ in mb/sterad

$H^3(p,\gamma)$ $E_p = 1.7$ to 6.8
No resonance observed scin > 14-Mev γ

N.A.Vlasov, S.P.Kalinin, A.A.Ogloblin, V.A. Sidorov, V.I.Chuev, Soviet Phys. JETP 1, 500 (1955); Zhur. Ekseptl' i Teoret. Fiz. 28, 639 (1955).

He^4 (2 2)

$H^2(d,n)$ $E_d = 0.25$ to 0.82
d,n(θ,E) studied. Less isotropy found than in previous work. Stripping-theory fit possible if R assumed to decrease as E_d increases.
2 crystal delay spectrometer

P.R.Chagnon, G.E.Owen, Phys. Rev. 101, 1798 (1956).

$H^2(d,n)$ $E_d = 1.15$ to 4.60
Table of $\sigma(0°)$ given ppl

$H^3(p,n)$ $E_p = 8.8$ to 11.4
Table of $\sigma(0°)$ given ppl
$\sigma(0°)$ increases with E_p from 18 to 31 mb/sterad

L.Stewart, G.M.Frye, Jr., L.Rosen, Bull. Am. Phys. Soc. 1, No. 2, 93, M2 (1956).

$He^{(4)}(p,p')$ $E_p = 3.2$; a, scin
No level ≤ 28 Mev $\sigma(60°) < 0.25$ mb/sterad

R.M.Eisberg, Bull. Am. Phys. Soc. 1, No. 1, 19, DA1 (1956).

He^5 (2 3)

Level $Li^{(7)}(d,\alpha)$ $E_d = 3.7$
g.s. Q = 13.719 *20* s

L.M.Khromchenko, V.A.Blinov, Soviet Phys. JETP 1, 596 (1955); Zhur. Eksptl'. i Teoret. Fiz. 28, 741 (1955).

$H^3(d,n)$ $E_d = 0.2$ to 6.25
Tables of $\sigma(\theta,E)$ given pc, scin

S.J.Bame, Jr., J.E.Perry, Jr., Bull. Am. Phys. Soc. 1, No. 2, 93, M3 (1956).

$H^3(d,n)$ $E_d = 1$ to 5; pc + scin
No sharp resonance but σ rising at $E_d = 5$
Forward peak in d,n(θ) sharper with higher E_d

C.H.Johnson, A.Galonsky, Phys. Rev. 100, 1252A (1955).

$He^{6}_{2\ 4}$ $H^3(t,t)$ $E_t = 1.6$ to 2.0
$\sigma(\theta,E)$ measured. No evidence of He^6 excited state between 13.05 and 13.25 pc in coinc

D.M.Holm, H.V.Argo, Phys. Rev. 101, 1772 (1956).

$Li^{5}_{3\ 2}$ $He^{(4)}(p,p)$ $E_p = 7.5$, 31 angles
Phase shifts agree with values for lower E_p

T.M.Putnam, J.E.Brolley, Jr., L.Rosen, Bull. Am. Phys. Soc. 1, No. 1, 9, AB2 (1956).

Polarization $He^{(4)}(p,p);(p,p)$ ppl
$E_{p1} = 5.32$, $\theta_1 = 45°$ for 1st scattering, S_1
$E_{p2} = 2.7$, $\theta_2 = \pm 90°$ for 2nd scattering, S_2
P_1, polarization after S_1, = 0.40 ± 0.05 agreeing with $P_1 = 0.39 \pm 0.04$ calc. from phase shifts. $p_{1/2}, p_{3/2}$ splitting of several Mev implied.

A.C.Juveland, W.Jentschke, Z. Phys. 144, 521 (1956).

Polarization $He^{(4)}(p,p);(p,p)$ $E_p = 3.0$; ppl
$\theta_1 = 90°$ c.m.; $\theta_2 = \pm 73°$, $\pm 100°$, $\pm 125°$ c.m.
P_1P_2 from forward-backward ratio agrees with value calculated from phase shifts

M.J.Scott, R.E.Segel, Phys. Rev. 100, 1244 (1955).

Capture γ's $H^2(He^3,\gamma)$ $E_{He^3} \leq 1.5$; scin
$E_\gamma(max) \sim 16.5$, spread in $E_\gamma \sim$ several Mev

W.E.Kunz, J.W.Butler, H.D.Holmgren, Phys. Rev. 100, 1252A (1955).

$Li^{6}_{3\ 3}$ Levels $Li^{(7)}(p,d)$ $E_p \sim 18$
17† g.s. $l_n = 1$ p,d(θ)
8.5† (2.19) $l_n = 1$
†Peak σ in mb/sterad c.m.

J.B.Reynolds, K.G.Standing, Phys. Rev. 101, 158 (1956); 95, 639A (1954).

$Li^{7}_{3\ 4}$ $He^{(4)}(t,t)$ $E_t = 1.2$ to 2.2
Table of $\sigma(\theta,E_t)$ given

A.Hemmendinger, Bull. Am. Phys. Soc. 1, No. 2, 96, N7 (1956).

Levels $Li^{(6)}(d,p)$ $E_d = 3.7$ to 4.7
4.454 ~*20* s
6.530 ~*20*
Based on g.s. Q = 5.020

L.M.Khromchenko, V.A.Blinov, Soviet Phys. JETP 1, 596 (1955); Zhur. Eksptl' i Teoret. Fiz. 28, 741 (1955).

$Li^{7}_{3\ 4}$ Levels $Be^9(d,\alpha)$ $E_d = 0.50$, 0.70
4.62 s; 70°
No evidence of 5.5 level

R.W.Gelinas, S.S.Hanna, Phys. Rev. 100, 1253A (1955).

Level $Li^6(n,n)$ $E_n = 0.21$ to 0.40
(7.46) $J = 5/2^-$ n,n(θ)

H.B.Willard, J.K.Bair, J.D.Kington, H.O.Cohn, Phys. Rev. 101, 765 (1956).

$Li^{8}_{3\ 5}$ Levels $Li^{(7)}(d,p)$ $E_d = 3.7$ to 4.7
g.s. Q = -0.183 *20* s
0.977 *20*

L.M.Khromchenko, V.A.Blinov, Soviet Phys. JETP 1, 596 (1955); Zhur. Eksptl' i Teoret. Fiz. 28, 741 (1955).

Level $Li^{(7)}(n,n)$ $E_n = 0.229$ to 0.275
(2.28) $J = 3^+$ n,n(θ)
Background s-wave channel spin 2 predominant

R.G.Thomas, M.Walt, R.B.Walton, R.C.Allen, Phys. Rev. 101, 759 (1956).

Level $Li^7(n,n)$ $E_n = 0.20$ to 0.60
(2.28) $J = 3^+$ n,n(θ)
Background s-wave channel spin statistical

H.B.Willard, J.K.Bair, J.D.Kington, H.O.Cohn, Phys. Rev. 101, 765 (1956).

Polarization $Li^{(7)}(p,n)$; $Li^{(7)}(n,n)$
$E_p = 2.2$, $\theta_1 = 70°$; $E_n = 0.28$, $\theta_2 = \pm 49°, \pm 82°$
P_1P_2 (due to Li^8 2.28 level) ~0.24

H.B.Willard, J.K.Bair, H.O.Cohn, J.D.Kington, Bull. Am. Phys. Soc. 1, No. 1, 54 R1 (1956).

$Be^{7}_{4\ 3}$ Levels $Li^{(7)}(p,n)$ $E_p = 2.6$ to 2.9
100+ g.s. $He^3(n,p)$ detector
~4+ to 10+ (0.43) at several angles
p,n(θ) ~ isotropic for both n groups
σ(0.43 level)/σ(g.s.) increases with E_p

R.Batchelor, G.C.Morrison, Proc. Phys. Soc. 68A, 1081, 452 (1955).

Level $Li^{(7)}(p,n)$ $E_p = 1.8$ to 4.5; VdG,
0.434 *4* thresh n, ~0°
σ(0.434 level)/σ(g.s.) = 0.0018 *6* for $E_p = 2.40$

J.B.Marion, T.W.Bonner, C.P.Cook, Phys. Rev. 100, 91 (1955).

$Be^7_{4\ 3}$

Capture γ's $Li^6(p,\gamma)$ $E_p = 0.4$ to 1
38† ~5.8 Q = 5.66 *3* scin
62† ~6.2
†Intensity ratio not f(E or θ). $W(\theta) = 1 + \cos^2\theta$

J.B.Warren, T.K.Alexander, G.B.Chedwick, Phys. Rev. 101, 242 (1956).

$Be^8_{4\ 4}$

Level $Be^9(p,d)$ $E_p = 31.3$
g.s. $l_n = 1$? p,d(θ)
Poor stripping-theory fit (R = 4)

J.Benveniste, R.G.Finke, E.A.Martinelli, Phys. Rev. 101, 655 (1956).

Level $Be^9(p,d)$ $E_p = 16.5$
11† g.s. $l_n = 1$ (2?) p,d(θ)
†$\sigma(23°)$ in mb/sterad c.m.
Stripping theory fit requires R = 3 while at $E_p = 5$, R = 6 is needed. Cf. He^4, Chagnon.

J.B.Reynolds, K.G.Standing, Phys. Rev. 101, 158 (1956); 95, 639A (1954).

Level $He^{(4)}(\alpha,\alpha)$ $E_\alpha = 3$ to 5
g.s. $\Gamma = 17$ ev $\alpha,\alpha(\theta)$

J.L.Russell, G.C.Phillips, C.W.Reich, R.R. Henry, Bull. Am. Phys. Soc. 1, No. 2, 96, N8 (1956); verbal report.

Levels $Li^6(He^3,p)$ $E_{He3} = 1.25$
g.s. 45°, 90°, 135°
100† 2.9 absorbers + scin
5.6† 12.3 $\Gamma \sim 2$
No evidence for levels at 4.05, 4.9, 5.3, 7.5 (<1† if sharp, <3† if broad)

C.D.Moak, W.R.Wisseman, Phys. Rev. 101, 1326 (1956).

Levels $C^{(12)}(\gamma,\alpha)$ 2500 stars; ppl $E_\gamma \leq 40$

Level	Γ	J
g.s.	0.03	0
2.95 *10*	0.70 *15*	2
4.0 *1* ?	<0.3	2,4
6 ?	<1.0	0,2,4
10 ?	<1.0	0,2,4
15 ?	<1.0	0,2,4
16.4 2 ?	<0.4	0,2
16.8 2	<0.3	2
17.6 2	<0.3	2(0?)

? Not only possible interpretation of data
$\gamma,\alpha(\theta)$ for g.s., 2.9, 16.8, 17.6 levels. See C^{12}.

F.K.Goward, J.J.Wilkins, Proc. Roy. Soc. 228, 376 (1955).

Level $B^{(11)}(p,\alpha_i)Be^8 \to 2\alpha_j$ $E_p = 0.163$
(2.9) J = 2 $\alpha_i\alpha_j(\theta)$

E.H.Geer, E.B.Nelson, E.A.Wolicki, Phys. Rev. 100, 215; 98, 241A (1955).

$Be^8_{4\ 4}$

Level $Li^7(p,\gamma)Be^8 \to 2\alpha$ $E_p = 0.44$
2.9 s
No α groups attributable to Be^8 levels at 2.0, 2.6, 3.7 (< 1.0, 0.7, 0.5% of total α's)

E.C.LaVier, S.S.Hanna, R.W.Gelinas, Phys. Rev. 100, 1252A (1955).

Levels $C^{(12)}(\gamma,\alpha)$ $E_\gamma \leq 27, \leq 33$
Distribution of Be^8 excitation energies calculated from 485 stars shows maxima at ~2.5, ~9 (E_γ < 12.5); ~2.5, ~10.5, ~13.5, ~16.5 (E_α > 12.5)

F.I.Havlíček, B.Dobovišek, Phys. Rev. 100, 1355 (1955).

Levels $C^{(12)}(\gamma,\alpha)$ $E_\gamma = 17.6$; ppl
3.2 455 stars
4.0
7.5 broad
9.0

H.Glättli, E.Loepfe, F.Stoll, Helv. Phys. Acta 28, 366A (1955).

$Be^9(d,t)$ $E_d = 0.47$ to 1.15
No evidence of level 4.0 to 4.3 s; 23° to 90°

R.W.Gelinas, S.S.Hanna, Phys. Rev. 100, 1253A (1955).

Levels $Li^{(7)}(p,\gamma)$ $E_p = 0.40, 0.47, 0.54$
No levels between 7 and 15 Mev excited (<3% of g.s.) pc for γ's, 90°

A.C.Riviere, P.B.Treacy, Australian J. Phys. 8, 408 (1955).

Level $Li^{(7)}(p,\gamma)$ p res. calibration
17.628 $E_0 = 0.4412$ *6* s77

F.Bumiller, H.H.Staub, H.E.Weaver, Helv. Phys. Acta, 29, 83 (1956); 28, 355A (1955).

Levels $Li^7(p,p)$ $E_p = 1.3$ to 3.0
At 6 angles from 70° to 167°, σ shows max at 2,000, dip at 2.230, anomaly near 1.882

P.R.Malmberg, Phys. Rev. 101, 114 (1956); 98, 1167A (1955).

$Be^9_{4\ 5}$

Level $Be^9(p,d)$ $E_p = 31.3$
g.s. $l_n = 1$? p,d(θ)
See Be^8, Reynolds, Standing; Benveniste et al.

Be^9
4 5

Levels $Be^9(\alpha,\alpha')$ $E_\alpha = 44$; a pc
g.s. 13°, 70°, 114°
<1† 1.8
10† 2.4 *1* 13°, 70°, 114°
5† 3.1 ? 70°
$\alpha,\alpha'(\theta)$ suggests collective excitation
Levels at 4.8, 6.8 not seen
†Relative intensity at 70°

G.W.Farwell, D.D.Kerlee, Bull. Am. Phys. Soc. 1, No. 1, 20, DA5 (1956); verbal report.

Levels $Be^9(p,p')$ $E_p = 4.6$ to 5.3
23† g.s. s
1† 1.675 *2* ?*
~4† 2.432 *4* $\Gamma \le 0.001$ implies $J \ge 5/2$
†$\sigma(170°)$ in mb/sterad
*Attributable to level or 3-body break-up

C.R.Gossett, G.C.Phillips, J.P.Schiffer, P.M. Windham, Phys. Rev. 100, 203 (1955).

Levels $Be^9(p,p')$ $E_p = 31.3$; $p,p'(\theta)$

Level	l*	Level	l*
g.s.	1, (2?)	7.94 *8*	3
2.46 *5*	1(2?)	11.3 *2*	
5.0 *3*		19.9 *1*	0
6.76 *6*	1**	21.7 *1*	0 or 1

*l of Austern, Butler, McManus theory
**If level is double, $l = 1$ for 6.2, 2 for 6.8
3 pc differential range spectrometer

J.Benveniste, R.G.Finke, E.A.Martinelli, Phys. Rev. 101, 655 (1956).

Levels $Be^9(\alpha,\alpha')$ $E_\alpha = 21.6$
$Be^9(d,d')$ $E_d = 10.8$
1.74 *10* ?* s; several
(2.428) angles
3.01 *10*
*Attributable to level or 3-body break-up

D.W.Miller, V.K.Rasmussen, M.B.Sampson, U.C. Gupta, Phys. Rev. 100, 851, 1253A (1955).

Levels $Be^9(p,p')$ $E_p = 12$
$Be^9(d,d')$ $E_d = 24$
$Be^9(\alpha,\alpha')$ $E_\alpha = 48$
~1+ 1.8 ?
100+ 2.43 $l_x = 1$ $xx'(\theta)$

R.G.Summers-Gill, Phys. Rev. 100, 1795A (1955).

Level $Be^9(n,n')$ $E_n = 3.7$
(2.43) decays to Be^8 + n scin

J.M.Fowler, S.S.Hanna, G.E.Owen, Phys. Rev. 98, 249A (1955).

Be^{10}
4 6
2.5×10^6 y

Yield in $U^{235}(n,f) \le 4 \times 10^{-4}$%

K.F.Flynn, L.E.Glendenin, E.P.Steinberg, Phys. Rev. 101, 1492 (1956).

B^9
5 4

Levels $B^{10}(p,d)$ $E_p = 18.9$
g.s. $l_n = 1$ $p,d(\theta)$
2.41 *15* $l_n = 1$

J.B.Reynolds, K.G.Standing, Phys. Rev. 101, 158 (1956); 95, 639A (1954).

Levels $Be^9(p,n)$ $E_p = 2.0$ to 5.5; VdG
1.4* ? $\Gamma \sim 1$ thresh n, ~0°
2.327 *5* Q=-4.178 *5*
*Also attributable to 3-body break-up
$\sigma(E_p = 2.52) = 11$ mb/sterad

J.B.Marion, T.W.Bonner, C.F.Cook, Phys. Rev. 100, 91 (1955).

B^{10}
5 5

Level $B^{11}(p,d)$ $E_p = 18.9$
g.s. $l_n = 1$ $p,d(\theta)$

J.B.Reynolds, K.G.Standing, Phys. Rev. 101, 158 (1956); 95, 639A (1954).

Levels $Li^7(\alpha,n)$ $E_\alpha \sim 8$
g.s. Q=-2.82 *10*
0.74 *6* p recoil,
1.31 *6* thresh n; ~0°
1.72 *6*

A.B.Robbins, Phys. Rev. 101, 1373 (1956); 100, 1549A (1955).

Level $Be^9(d,n)$ time of flight
(0.72) $\tau = 790^{\mu\mu s}$ *200*

J.C.Severiens, S.S.Hanna, Phys. Rev. 100, 1254A (1955); verbal report.

B^{11}
5 6

Levels $Li^{(7)}(\alpha,n)$ $E_\alpha = 4.1$ to 5.8
2.5* 11.69 thresh n, ~0°
3.4* 11.95 $\Gamma = 0.24$
*$\sigma(0°)$ in mb/sterad

H.Bichsel, T.W.Bonner, Bull. Am. Phys. Soc. 1 No. 2, 93, M5 (1956).

Levels $Be^9(He^3,p_0)$ $E_{He^3} = 2$; ppl
Graphs of $He^3,p_0(\theta)$; $He^3,p_1(\theta)$; $He^3,p_2(\theta)$; $He^3,p_3(\theta)$ show no symmetry about 90°

H.D.Holmgren, W.E.Kunz, M.L.Bullock, Phys. Rev. 100, 436, 1253A (1955).

B^{12}
5 7
0.03 s

β^- 17† (8.94) pc, scin $\beta\gamma$
1000† (13.37)
No γ with $3.3 < E_\gamma < 4.5$ (< 4 ± 20†)
Li^8 comparison $B^{(11)}(d,p)$, pulsed beam

N.W.Tanner, Phil. Mag. 1, 47 (1956).

B^{12} 5 7 0.03[s]

$\beta(4.4\gamma)/\beta = 0.013$ *4* scin
$\beta(3.2\gamma)/\beta \leq 0.002$ $\beta(7.6\gamma)/\beta \leq 0.002$
Conclude J = 1 for B^{12} g.s.

C. A. Barnes, R. W. Kavanagh, Phys. Rev. 100, 1796A (1955).

α ~1% 0.195 B^{11}(d,p); s
Presumably from C^{12} 7.65 level to Be^8 g.s.

W. A. Fowler, C. W. Cook, C. C. Lauritsen, T. Lauritsen, F. Mozer, Bull. Am. Phys. Soc. 1, No. 4, 191 M2 (1956).

B^{12} 5 7

Level $Be^9(\alpha,p)$ $E_\alpha = 21.6$
3.38 s
p's to this level previously* interpreted as d's

V. K. Rasmussen, D. W. Miller, M. B. Sampson, U. C. Gupta, Phys. Rev. 100, 851 (1955); *W. O. McMinn et al., Phys. Rev. 84, 963 (1951).

C^{11} 6 5

Levels B^{10}(d,n) $E_d = 0.35$ to 4.5; VdG thresh n, ~0°

0.18†	8.107 *8*
1.0†	8.430 *8*
1.6†	8.660 *8*

No n thresholds observed corresponding to levels at 6.87, 7.39, 8.97, 9.13, 9.70, 10.06
Graph of σ(~0°) given for n yield
†Relative intensities at thresholds, 0°

J. B. Marion, T. W. Bonner, C. F. Cook, Phys. Rev. 100, 847 (1955).

C^{12} 6 6

Levels $B^{10}(\alpha,d)$ EA
g.s. Q = 1.3405 *10*

$N^{(14)}(d,\alpha)$ EA
(9.64) Q = 3.928 *11* Γ~0.035

R. Chiba, R. A. Douglas, J. W. Broer, D. P. Herring, E. A. Silverstein, Phys. Rev. 100, 1253A (1955); verbal report

Levels $C^{(12)}(\alpha,\alpha')$ $E_\alpha = 22$ s
g.s.
(4.43)
7.64 *7* $\Gamma_\alpha/\Gamma_\gamma > 0.8$*
(9.6)
(12.7) ?
*From absence of C recoils
α, α'(θ) not symmetric about 90° c.m.

V. K. Rasmussen, D. W. Miller, M. B. Sampson, Phys. Rev. 100, 181 (1955).

Levels $Be^9(\alpha,n\gamma)$ $E_\alpha \leq 4.3$ sl pr
3mb* 4.48 *6*
(7.6) $\Gamma_\alpha/\Gamma_\gamma = 0.96$**
**From absence of prs from 7.6 level to g.s. and 4.5 level (<5% of prs from 4.5 level)
*Average σ for $E_\alpha = 0$ to 4.3

R. D. Bent, T. W. Bonner, J. H. McCrary, W. A. Ranken, Phys. Rev. 100, 771 (1955).

C^{12}

Level $Be^9(\alpha,n)$ $E_\alpha = 5.3$
(7.6)
No prs observed from 7.6 level (< 0.3% of prs from 4.4 level)

G. Goldring, R. Wiener, Y. Wolfson, Bull. Research Council Israel 5A, 87A (1955).

Level $B^{(11)}$(d,n) $E_d = 1.0$ to 5.5; VdG
15.100 *6* thresh n, ~0°
Graph of σ(~0°) given for n yield

J. B. Marion, T. W. Bonner, C. F. Cook, Phys. Rev. 100, 847 (1955).

Level $B^{(11)}(d,n\gamma)$ $E_d = 1.6$ to 3.3
15.106* *3* No α observed; scin
*From threshold for ~15γ = 1.633 *3*
12.8γ observed at $E_d = 1.63$**

C. A. Barnes, R. W. Kavanagh, Phys. Rev. 100, 1796A (1955); **verbal report.

Level $C^{(12)}(\gamma,\gamma)$
15.0 *2* Γ~100 ev $\Gamma_\gamma/\Gamma > 0.5$

E. G. Fuller, E. Hayward, N. Svantesson, Bull. Am. Phys. Soc. 1, No. 1, 21, DA8 (1956); verbal report.

Levels $B^{(11)}(p,\alpha_i)2\alpha_j$ $E_p = 0.163, 0.290$
(16.10) J = 2 $\alpha_i\alpha_j(\theta)$
(16.57) J ≠ $2^-, 3^+$*, J = 2^+*
(17.22) J ≠ 1^-*
*Assuming single level is responsible for $\alpha_i\alpha_j(\theta)$ for $E_p = 0.290$. Results also explainable by mixture, 16.57 (2^-), 17.22 (1^-)

E. H. Geer, E. B. Nelson, E. A. Wolicki, Phys. Rev. 100, 215; 98, 241A (1955).

Levels $B^{11}(p,\gamma_o$ or $\gamma_1)$ $E_p = 2.0$ to 5.3
B^{11}(p,n) VdG 0°, 90°
$B^{11}(p,p'\gamma_j)$ scin, long counter

Γ	Level	n	γ_o	γ_1	γ_j
0.3	18.3	--	st	w	--
0.046	18.39	--	--	--	st
0.1	18.84	st	st	w	st
0.5	19.2	st	st	st	st
0.05	19.41	--	--	--	st
0.2	19.66	st	--	--	--
0.1	19.87	--	w	--	st
0.2	20.25	st	--	--	st
0.2	20.48	--	st	--	--
0.2	20.64	--	st	--	st

J. K. Bair, J. D. Kington, H. B. Willard, Phys. Rev. 100, 21 (1955).

Levels* $C^{(12)}(\gamma,n)20^mC^{11}$ $E_\gamma \leq 20$
19.10 *5*
19.55 *5*
*Sharp peaks in activation curve

B. M. Spicer, A. S. Penfold, Phys. Rev. 100, 1375 (1956).

$_6C^{12}_6$

$C^{(12)}(\gamma,n)$ $E_\gamma \leq 23$

$\gamma,n(\theta)$ possibly has dip at 90° n scin

B.P.Fabricand, B.Allison, J.Halpern, Phys. Rev. 100, 1249A (1955).

Levels $C^{(12)}(\gamma,3\alpha)$ $E_\gamma \leq 27, \leq 33$

Distribution of C^{12} excitation energies calc. from 485 stars. Levels not clearly resolved.

F.I.Havlíček, B.Dobovišek, Phys. Rev. 100. 1355 (1955).

$C^{(12)}(\gamma,3\alpha)$ $E_\gamma \leq 40$; ppl

E_γ		Be^8 levels*	$\gamma,\alpha(\theta)$
13.0 to 15.6	E2	g.s.	2500 stars
	E2,M1	2.9	
15.6 to 25	E1,E2	2.9,4.0,g.s.,6 and 10, 15	
>25	E1	16.8,17.6, 6 and 10 2.9 and 4,15,g.s.	

*In order of observed frequency. See Be^8

Level 21.9 J = 2† T = 0

Only level of previous work to which spin could be assigned

F.K.Goward, J.J.Wilkins, Proc. Roy. Soc. 228, 376 (1955).

$_6C^{13}_7$

Level $C^{(12)}(d,p)$ $E_d = 2.68, 3.26$

19,13† g.s.

†σ(peak) for above E_d respectively. σ's for C^{13}, N^{13} show g.s. reduced widths ~ same.

R.E.Beneson, K.W.Jones, M.T.McEllistrem, Phys. Rev. 101, 308 (1956).

Levels $B^{10}(\alpha,p)$ $E_\alpha = 8.1$ scin, 90°

100†	g.s.	Q = 4.08 *3*	
60†	3.07 *5*		
600†	3.86 *5*		

No 0.7 level (<7†)

G.F.Pieper, G.S.Stanford, Phys. Rev. 101, 672 (1956).

Levels $C^{12}(d,p)$ $E_d = 14.8$; s $d,p(10° < \theta < 87°)$

		l_n		
26†	g.s.	1	9.6††	7.53 *2*
103†	3.09	0	7.5††	7.64* *2*
16†	3.68	1	100††	8.4** *3*
152†	3.86	2	1.6††	9.50 *2*
3.6††	6.87	0,2	2.2††	9.90 *2*
0.8††	7.47 *2*		5.5††	10.76 *2*

d,p(θ) shows forward peak for all except 9.50 level for which distribution is isotropic

†,†† mb/sterad at † max or at †† 10°

*Γ = 0.070 ± 0.015 **Γ = 1.1 ± 0.3

J.N.McGruer, E.K.Warburton, R.S.Bender, Phys. Rev. 100, 235 (1955).

$_6C^{13}_7$

Levels $C^{(12)}(n,n'\gamma)$ $E_n = 4.4$ to 8 scin 4.4γ

10.77
10.94
11.97
12.21

H.E.Hall, T.W.Bonner, Bull. Am. Phys. Soc. 1, No. 2, 96, N10 (1956).

Levels $Be^9(\alpha,n\gamma)$ $E_\alpha = 1.6$ to 5.2 BF_3; scinγ

σ_n*	$\sigma_{4.4\gamma}$**	Level	Γ
25	14	11.97	0.2
14		12.25	~0.2
20	5	12.45	~0.2
79	20	13.41	0.06
60	18	13.7	~0.4
87	23	14.1	~0.3

*mb/sterad, 0 to 20° **mb/sterad, 0° to 10°

J.P.Schiffer, T.W.Bonner, A.A.Kraus,Jr., J.B. Marion, Bull. Am. Phys. Soc. 1, No. 1, 20, DA3 (1956); verbal report.

Levels $Be^9(\alpha,n)$ $E_\alpha = 1.7$ to 5.1

Level	n group	Γ
12.45	n_0(st), n_1(w)	
13.5	n_1(st)	small
13.5 to 13.8	n_0, n_1	large

α,n(θ) shows forward peaking

J.R.Risser, C.M.Class, J.E.Price, Bull. Am. Phys. Soc. 1, No. 1, 20, DA4 (1956).

Levels $Be^9(\alpha,n_0)$ $E_\alpha = 2.5$ to 5

Level	J	
12.45		α,n(θ)
~13.5	5/2+	
13.7	3/2+	
>14	7/2+	

J.R.Risser, Bull. Am. Phys. Soc. 1, No. 2, 93 M4 (1956).

Resonance $C^{13}(\gamma,n)$ $E_\gamma \leq 45$ BF_3

peaks 4* 14.5 Γ = 4

9.5* 24 Γ = 8

*σ(peak) in mb

B.C.Cook, V.L.Telegdi, Bull. Am. Phys. Soc. 1, No. 1, 63, UA11 (1956); verbal report.

Levels $B^{(11)}(d,n+15.1\gamma)$ $E_d \leq 3.3$

σ = 17mb 20.51 ? Sharp decrease in slope

21.27 Weak resonance, Γ~0.18

C.A.Barnes, R.W.Kavanagh, Phys. Rev. 100, 1796A (1955).

C^{13} 6 7 | Levels | $B^{11}(d,n_o)$ 22 to 23 J = 7/2 | E_d = 3.5 to 5 $d,n_o(\theta)$

J.E.Price, C.M.Class, J.R.Risser, Bull. Am. Phys. Soc. 1, No. 2, 94, M10 (1956).

C^{14} 6 8 | Levels | C^{13}(d,p) | E_d = 14.8; s d,p($10° < \theta < 87°$)

		l_n			
10†	g.s.	1	7.1††	9.80	2
62†	6.09	0	~1.9††	10.43	2
1.6†	6.59 2	0,2	1.4††	10.50	2
74†	6.72	2	90††	11.9**	3
22†	6.89	1	6.3††	12.60*	2
56†	7.35 2	2	1.0††	12.85	2
2.2††	8.32 2		1.9††	12.96	2

d,p(θ) shows forward peak for all levels
†,†† mb/sterad at † max or at †† 10°
*Γ = 0.13 ± 0.02 **Γ = 1.1 ± 0.3

J.N.McGruer, E.K.Warburton, R.S.Bender, Phys. Rev. 100, 235 (1955).

Levels | $C^{13}(d,p\gamma)$ | E_d = 4.1
(6.1) E1 γ (assumed) sl pr
(6.7) E2 γ (or E1, M1, E3)*
*From (ext 6.7 prs)/(ext 6.1 prs) = 0.51 ± 0.04
(int 6.7 prs)/(int 6.1 prs) = 0.47 ± 0.03

R.D.Bent, T.W.Bonner, J.H.McCrary, W.A. Ranken, Phys. Rev. 100, 771 (1955).

C^{15} 6 9 2.4s | τ 2.25s | C^{14}(≥1.3-Mev d,p)
β^- 80% 4.3 | Compared to thick
20% 9.8 | Pr^{144} source scin
$\gamma(N^{15})$ 100† 5.3
No 1.9 γ (<10†) No other γ (<5†)

R.A.Douglas, B.Gasten, J.Downey, A.Mukerji, Bull. Am. Phys. Soc. 1, No. 1, 21, DA13 (1956); verbal report.

C^{14}(d,p)2.4sC E_d = 0.6 to 3.0
Previously reported activity for E_d < 1.3 ascribed to $O^{18}(d,\alpha)7.4^sN^{16}$, i.e. Q ≠ 0.15

N.A.Bostrom, E.L.Hudspeth, I.L.Morgan, Bull. Am. No. 2, 94, M12 (1956).

N^{13} 7 6 10m | τ 10.08m 4 | $C^{(12)}$(14.1-Mev d,n)

D.H.Wilkinson, Phys. Rev. 100, 32 (1955).

N^{13} 7 6 | Level | $C^{(12)}$(d,n) | E_d = 2.68, 3.26
32, 31† g.s.
†σ(peak) for above E_d respectively. σ's for C^{13}, N^{13} show g.s. reduced widths ~ same.

R.E.Benenson, K.W.Jones, M.T.McEllistrem, Phys. Rev. 101, 308 (1956).

N^{13} 7 6 | Level | $N^{(14)}$(p,d) | E_p = 18.7
~5† g.s. l_n = 1 | p,d(θ)
2.37 level not seen [σ(14°c.m.) < 0.4 mb/sterad]
†σ(18°c.m.) in mb/sterad

K.G.Standing, Phys. Rev. 101, 152 (1956).

Level | $C^{(12)}$(d,n) | E_d = 2.8 to 3.9; VdG
2.37 2 | thresh n, ~0°
Graph of σ(~0°) given for n yield

J.B.Marion, T.W.Bonner, C.P.Cook, Phys. Rev. 100, 847 (1955).

Levels | $B^{10}(\alpha,n)$ | E_α ~8
2.4 3 | p recoil,
3.6 3 | thresh n; ~0°
4.3 3 ?
5.0 3
g.s. Q of 1.1 assumed

A.R.Quinton, W.T.Doyle, Phys. Rev. 101, 669 (1956).

Levels | $C^{(12)}$(p,p) | E_p = 4.0 to 5.5 s

Level	J	Γ	
6.371	5/2 +	0.012	p,p(θ)
6.90	3/2 +	0.100	

C.W.Reich, G.C.Phillips, J.L.Russell, R.R. Henry, Bull. Am. Phys. Soc. 1, No. 2, 96, N9 (1956); verbal report.

N^{14} 7 7 | Levels | $B^{11}(\alpha,n)$ | E_α ~8
g.s. Q = 0.0 3 | p recoil,
2.0 3 | thresh n; ~0°
3.15 30
3.85 30
4.8 3

A.R.Quinton, W.T.Doyle, Phys. Rev. 101, 669 (1956).

Level | $O^{(16)}(d,\alpha)$ | E_d = 5.5 to 7.5
2.31 | sπ 5 angles
Weak α group to this level established

C.P.Browne, Phys. Rev. 100, 1253A (1955); verbal report.

Level | $N^{(14)}(p,p'\gamma)$ | E_p = 19
γ (2.31) τ < 0.35 $\mu\mu$s | scin
Doppler effect $\Delta E/E$ ~ 0.009 (~ maximum possible)

R.Sherr, J.B.Gerhart, H.Horie, W.F.Hornyak, Phys. Rev. 100, 945 (1955).

$N^{14}_{7\ 7}$

Level $C^{(12)}(He^3,p\gamma)$ $E_{He^3} = 1.55$

3.95 level

$3.95\gamma/1.64\gamma$ = 0.04 8 p,γ

H.E.Gove, A.E.Litherland, E.Almqvist, D.A. Bromley, Bull. Am. Phys. Soc. 1, No. 4, 196 N3 (1956); verbal report.

Level $C^{13}(d,n)$ $E_d = 0.4$ to 4.2; VdG

5.683 7 $J = 1^{+*}$ thresh n, ~0°

*Slow rise suggests p-wave n's

Graph of σ(~0°) given for n yield

$C^{(12)}(d,n)$ $E_d = 2.8$ to 3.9; VdG

13.16 $J = 0^-, 1^{-**}$

**Increase of fast n's implies s-wave to g.s.

Graph of σ(~0°) given for n yield

J.B.Marion, T.W.Bonner, C.F.Cook, Phys. Rev. 100, 847 (1955).

Levels $C^{13}(p,p)$ $E_p = 1.5$ to 3.4 several angles

9.39	
9.51	10.29
9.70	10.43

D.Zipoy, K.Famularo, G.D.Freier, Bull. Am. Phys. Soc. 1, No. 1, 9, AB3 (1956).

Levels $C^{(12)}(d,d)$ $E_d = 2.4$ to 3.4 170°

12.309 $J = 4^-$

12.608 $J = 3^+$

M.T.McEllistrem, Phys. Rev. 100, 1253A (1955).

Levels $B^{10}(\alpha,n)$ $E_\alpha = 1.9$ to 5.3

$B^{10}(\alpha,p\gamma)$

Level	Γ	Level	Γ
13.15	0.03		
13.22	0.10	14.4*	~0.15
13.68	0.20	14.85	~0.13
14.1*	~0.50	15.44	~0.10

*Observed only for $\alpha,p\gamma$ reaction

T.W.Bonner, A.A.Kraus,Jr., J.B.Marion, J.P. Schiffer, Bull. Am. Phys. Soc. 1, No. 2, 96, M6 (1956).

(a) $C^{(12)}(d,n)10^mN^{13}$ $E_d = 20$ stacked foils

(b) $C^{(12)}(d,t)20^mC^{11}$

No resonances observed

Compound nucleus picture predicts for increasing E_d faster fall of σ(a), slower rise of σ(b) than observed

D.H.Wilkinson, Phys. Rev. 100, 32 (1955).

$N^{15}_{7\ 8}$

Level $C^{13}(d,\alpha)$ $E_d = 1.6$ to 2.3 s

Level	Γ	l
17.71	0.055 10	
18.06	0.022 4	3,(4?)*

d,$\alpha(\theta)$

$C^{13}(d,t)$ $E_d = 1$ to 3

18.06 level not observed

J.B.Marion, G.Weber, Bull. Am. Phys. Soc. 1, No. 2, 94, M11 (1956); verbal report.

Level $O^{(16)}(\gamma,p\gamma)$ $E_\gamma \geq 21$ scin

γ (6.33)

No other γ (<20% of 6.33γ) See also O^{15}

N.Svantesson, Bull. Am. Phys. Soc. 1, No. 1, 28, GA3 (1956).

Levels $N^{14}(d,p)$ EA

(7.31)	Q = 1.308 12
(7.58)	= 1.045 12
(8.32)	= 0.2958 6
(8.57)	= 0.038 10

R.Chiba, R.A.Douglas, J.W.Broer, D.F.Herring, E.A.Silverstein, Phys. Rev. 100, 1253A (1955); verbal report.

Capture γ's $N^{(14)}$(th n,γ) sπ pr

15†	3.520 20	17†	6.323 8
17†	3.669 16	9†	7.305 12
16†	4.497 11	4†	8.313 13
22†	5.259 8	0.2†	8.34 4
35†	5.288 7	0.2†	9.03 3
18†	5.534 8	1†	9.145 10
14†	5.543 8	12†	10.833 8

No 7.164 γ (< 0.8†)

†Photons/100 N radiative captures

P.J.Campion, G.A.Bartholomew, Bull. Am. Phys. Soc. 1, No. 1, 28, GA2 (1956); verbal report.

Levels $B^{11}(\alpha,n)$ $E_\alpha = 1.9$ to 5.3

Level	Γ	Level	Γ
12.50	0.059		
12.90	0.090	13.72	0.040
13.14	< 0.003	13.86	0.070
13.17	~0.007	14.11	~0.010
13.36	0.025	14.17	0.035
13.59	0.020	14.66	0.072

T.W.Bonner, A.A.Kraus,Jr., J.B.Marion, J.P. Schiffer, Bull. Am. Phys. Soc. 1, No. 2, 96, M6 (1956).

Levels $C^{13}(d,n)$ $E_d = 0.4$ to 4.2; VdG thresh n, ~0°

17.80 5	Γ ~0.6
18.27 3	~0.4
19.15 3	~0.15

J.B.Marion, T.W.Bonner, C.F.Cook, Phys. Rev. 100, 847 (1955).

N^{16} (7 9) 7^s

$\gamma(O^{16})$	6.1	O^{18}(1.3-Mev d, α)
	7.1	scin

No 1.0 γ

$\sigma[O^{18}(d,\alpha)]/\sigma[C^{14}(d,\gamma)] > 400$ at $E_d = 1.3$ for 7^sN

N.A.Bostrom, E.L.Hudspeth, I.L.Morgan, Bull. Am. Phys. Soc. 1, No. 2, 94, M12 (1956); verbal report.

Levels $C^{14}(d,p)2.4^sC^{15}$ $E_d = 1.3$ to 3.0

12.26	$\Gamma > 0.1$
12.86	$\Gamma > 0.1$

R.A.Douglas, B.Gasten, J.Downey, A.Mukerji, Bull. Am. Phys. Soc. 1, No. 1, 21, DA13 (1956).

O^{14} (8 6) 72^s

β^+ (4.1) sl

$4.1\beta^+/1.84\beta^+ = 0.60 \pm 0.10\%$

R.Sherr, J.B.Gerhart, H.Horie, W.F.Hornyak, Phys. Rev. 100, 945 (1955).

O^{14} (8 6)

Level $C^{(12)}(He^3,n)$ $E_{He^3} \leq 2.0$

g.s. $Q = -1.148$ *4*

J.W.Butler, Bull. Am. Phys. Soc. 1, No. 2, 94, M8 (1956); verbal report.

O^{15} (8 7)

Level $N^{(14)}(d,n)$ $E_d = 1.85$; d,n(θ)

g.s. $Q = 5.21$ *7* $l_p = 1$

I.Nonaka, S.Morita, N.Kawai, T.Ishimatsu, S. Suematsu, K.Takeshita, Y.Nakajima, Y.Wakuda, J. Phys. Soc. Japan 11, 1 (1956).

Level $O^{(16)}(\gamma,n\gamma)$ $E_\gamma \geq 21$

γ (6.14) scin

No other γ (< 20% of 6.14γ) See also N^{15}

N.Svantesson, Bull. Am. Phys. Soc. 1, No. 1, 28, GA3 (1956); verbal report.

Levels $N^{(14)}(d,n)$ $E_d = 1.0$ to 4.5; VdG

thresh n, $\sim 0°$

1†	6.20 *3*
4.6†	6.841 *9*
0.9†	6.909 *9*

Graph of $\sigma(\sim 0°)$ given for n yield

†Relative slow-n intensities at thresholds

J.B.Marion, R.M.Brugger, T.W.Bonner, Phys. Rev. 100, 46 (1955).

Level $N^{14}(p,p)$ $E_p = 0.95$ to 3.96

10.33 *8* pc, 132°

S.Bashkin, R.R.Carlson, J.A.Jacobs, Bull. Am. Phys. Soc. 1, No. 4, 212 SA9 (1956).

O^{15} (8 7)

Levels $C^{(12)}(He^3,p)$ $E_{He^3} = 1.0$ to 2.5

13.06 He^3,p(θ) varies rapidly

13.52 with E_{He^3} for all

13.96 p groups

$C^{(12)}(He^3,n)$

$\sigma(n)/\sigma(p)$ rises, then levels off

He^3,p(θ) and He^3,n(θ) similar

D.A.Bromley, H.E.Gove, A.E.Litherland, E.B. Paul, E.Almqvist, Bull. Am. Phys. Soc. 1, No. 4, 195 N2 (1956); verbal report.

O^{16} (8 8)

Levels $O^{(16)}(p,p')$ $E_p = 19$, 10 angles

$\int d\sigma$ in mb	Level	Coincidences	J
59	6.14 *2*		
34	7.02 *2*		
28	8.87 *3*	p'($\sim$2.4*, $\sim$6, $\sim$7γ)	2^- ($3^\pm$?)
8	9.85 *3*	*2.78 *4* in singles	
8	10.34 *3*		
19	11.08 *3*	p'($\sim$6, $\sim$7γ)	2^- (3^+?)
11	11.51 *3*		
6	12.02 *3*	p'γ	
11	12.53 *3*	p' (4.4γ in C^{12}?)	
$\sim$10	13.06 *3*		
	13.39		scin p

p,p'(θ) given for all but last two groups

W.F.Hornyak, R.Sherr, Phys. Rev. 100, 1409 (1955); 99, 632A (1955).

Levels $O^{(16)}(\gamma,\gamma)$ γ's from $F^{19}(p,\alpha\gamma)$

(6.91) $\tau = 2.3^{+2.9}_{-0.9} \times 10^{-14}$s

scin

(7.12) $\tau = 7^{+12}_{-3} \times 10^{-15}$s

C.P.Swann, F.R.Metzger, Bull. Am. Phys. Soc. 1, No. 4, 211 SA6 (1956); verbal report.

Levels $N^{15}(p,\alpha\gamma)$ $E_p = 0.80$ to 3.80

scin 4.43 γ, p,$\gamma(\theta)$

Level	Γ(kev)	J
12.95		
13.09	125 *15*	
13.25		
13.67	65 *10*	
13.98 *2*	25 *5*	
14.92 *3*	45 *10*	4^+
15.20 *4*	75 *15*	2^-, 3^+
15.25 *5*	700	
15.41 *4*	100 *25*	2^+ probable

$N^{15}(p,\gamma)$ reaction shows 13.09 level only

R.R.Carlson, S.Bashkin, Bull. Am. Phys. Soc. 1, No. 4, 211 SA7 (1956); verbal report.

Levels $N^{15}(p,\alpha_0)$ $E_p = 0.95$ to 3.80

pc, 132°

	13.09	
	13.25	
50†	14.91 *2*	
$\sim$50†	15.25	broad
100†	15.39 *3*	

13.67, 13.98, 15.20 levels not observed

†Total σ in mb

J.A.Jacobs, S.Bashkin, R.R.Carlson, Bull. Am. Phys. Soc. 1, No. 4, 212 SA8 (1956); verbal report.

$O^{16}_{8\ 8}$

Levels $N^{15}(p,\alpha_1\gamma)$ $E_p = 0.8$ to 3.2 scin γ

	Level	Γ(kev)
0.8†	13.235	22.5
1†	13.666	95 ± 10
~0.1†	13.976	<30
1.1†	14.922	90 ± 20

No level at 14.2

†Relative yield of C^{12} 4.4γ

R.R.Carlson, S.Bashkin, Phys. Rev. 100, 1254A (1955); verbal report.

Levels $N^{15}(p,\alpha\gamma)$ $E_p = 2.65$ to 5.25 scin 4.43γ

Level	Γ(kev)
14.92	60
15.19	60
15.40	95
15.79	30
16.43	25

L.Lidofsky, K.Jones, R.Bent, J.Weil, T.Kruse, M.Bardon, W.W.Havens,Jr., Bull. Am. Phys. Soc. 1, No. 4, 212 SA10 (1956).

Levels* $O^{(16)}(\gamma,n)2.0^mO^{15}$ $E_\gamma \leq 23.2$

∫σdE	Level	∫σdE	Level	∫σdE	Level
0.0046	15.85	0.182	17.68	0.617	20.79
0.040	16.03	0.254	17.84	0.857	20.93
0.027	16.47	0.059	18.04	1.36	21.21
0.041	16.75	0.094	18.70	0.853	21.52
0.084	16.95	0.130	19.01	2.21	22.37
0.111	17.02	0.396	19.18	3.14	22.54
0.262	17.13	0.495	20.33	3.47	22.76
0.404	17.18	0.603	20.58	3.06	23.02
0.202	17.55				

Estimates of Γ_γ show levels ≤ 19.2 are E2 excited, 22 to 23 are E1 excited

*Sharp breaks in activation curve

A.S.Penfold, B.M.Spicer, Phys. Rev. 100, 1377 (1955).

$O^{(16)}(\gamma,4\alpha)$ $E_\gamma \leq 70$, ppl

Levels in O^{16}, C^{12}, Be^8 connected by α emission

E_γ	O^{16}	C^{12}	Be^8
<25	22.3	9.6 ?	g.s., not 2.9
		10.8	g.s., not 2.9
		12.3 ? *3*	not g.s.
25 to 28	[26, 27.5]	15 to 16	?, not 4.1
28 to 35	[29.5, 32.5, 35]	[16, 18 to 19]	2.9

323 stars

W.K.Dawson, D.Livesey, Can. J. Phys. 34, 241 (1956).

Level $C^{(12)}(\alpha,\alpha_0$ or $\alpha_1)$

23.54 *10* $E_\alpha = 20.4$ to 22.6; s

$\alpha,\alpha_i(\theta)$ not symmetric about 90° c.m.

V.K.Rasmussen, D.W.Miller, M.B.Sampson, Phys. Rev. 100, 181 (1955).

$O^{16}_{8\ 8}$

$N^{(14)}(d,p+7.31\gamma)$ $E_d = 2.4, 4.0, 5.3$

$N^{(14)}(d,n+6.82\gamma)$ sl pr

$\sigma(d,p\gamma)/\sigma(d,n\gamma) = 2.6$, 1.5, 0.9 for above E_d

R.D.Bent, T.W.Bonner, J.H.McCrary, W.A. Ranken, Phys. Rev. 100, 771 (1955).

$O^{17}_{8\ 9}$

Levels $O^{(16)}(d,p)$ $E_d = 1.05$ to 2.51 scin, 5° to 160°

g.s.

(0.872)

d,p(θ) of stripping type except near resonance ($E_d = 1.7$) where curves are flattened

J.C.Grosskreutz, Phys. Rev. 101, 706 (1956).

Levels $C^{(13)}(\alpha,n)$ $E_\alpha = 0.83$ to 3.52

J	Level	Γ(kev)	J	Level	Γ(kev)
5/2	7.162	<8		8.341	20
5/2?	7.375	<5	5/2	8.400	<15
	7.570	<15	1/2	8.467	20
	7.679	30		8.498	<15
	7.93	150	1/2	8.70	90
	8.06	80		8.89	130
	8.21	75	5/2	8.96	70

α,n(θ)

R.B.Walton, J.D.Clement, Bull. Am. Phys. Soc. 1, No. 4, 211 SA5 (1956); verbal report.

Levels $C^{13}(\alpha,n)$ $E_\alpha = 2.0$ to 5.2

Level	Γ(kev)	Level	Γ(kev)
7.94	120	9.15	≤20
8.08	80	9.197	≤20
8.20	80	9.499	≤20
8.34	≤20	9.72	30
8.40	≤20	9.78	70
8.467	≤20	9.88	≤20
8.504	≤20	9.97	170
8.70	90	10.05	100
8.89	140	10.20	65
8.96	30		

Resonance σ's (0° to 10°) are 1 to 30 mb/sterad

J.P.Schiffer, T.W.Bonner, A.A.Kraus,Jr.,J.B. Marion, Bull. Am. Phys. Soc. 1, No. 1, 20 DA3 (1956).

Levels $C^{13}(\alpha,n)$ α,n(θ)

J	Level	J	Level
3/2	(8.19)	7/2	(9.50)
5/2	(8.40)	7/2	(9.72)
3/2(5/2?)	(8.50)	9/2	(9.88)
3/2(−?)	(8.70)	7/2	(9.97)
3/2	(8.89)		

long counter

J.P.Schiffer, A.A.Kraus,Jr., J.R.Risser, Bull. Am. Phys. Soc. 1, No. 4, 211 SA3 (1956); verbal report.

$O^{18}_{8\ 10}$

Levels $F^{19}(n,d)$ $E_n = 14.1$ pc n,d(θ)

st g.s. Q = −5.79 *8* $l_p = 0$

w 1.9 $l_p = 2(1?)$

No other levels below 3.0

F.L.Ribe, Phys. Rev. 100, 1254A (1955).

O^{18} 8 10

Level $O^{18}(p,p')$ $E_p = 4.58, 5.28$

1.981 *4* 8π

2.445 level not observed

R.R.Spencer, G.C.Phillips, J.P.Schiffer, T.E. Young, Bull. Am. Phys. Soc. 1, No. 2, 95, M13 (1956).

Levels	$F^{19}(t,\alpha)$	$E_t = 1.8$
	1.989 *24*	sd; 90°
	3.504 *34*	5.311 *40*
	3.929 *40*	5.456 *40*
	5.007 *40*	6.190 *40*
	5.170 *40*	6.328 *40*

N.Jarmie, Bull. Am. Phys. Soc. 1, No. 1, 28, GA4 (1956); verbal report.

F^{16} 9 7

$N^{(14)}(He^3,n)$ $E_{He^3} \leq 2.0$

Reaction not observed, g.s. $Q < -1.65$

J.W.Butler, Bull. Am. Phys. Soc. 1, No. 2, 94, M8 (1956).

F^{17} 9 8

Levels $O^{(16)}(d,n)$ $E_d = 1.8$ to 4.3; VdG

g.s. $Q = -1.626$ *4* thresh n,

0.499 *3* ~0°

Graph of $\sigma(\sim 0°)$ given for n yield

J.B.Marion, R.M.Brugger, T.W.Bonner, Phys. Rev. 100, 46 (1955).

Levels	$O^{(16)}(p,p)$		$E_p = 2.5$ to 5.6	
	3.10	$J = 1/2^{-*}$	5.45	$\Gamma \sim 0.60$
	3.86		5.66	~0.50
	~4.7	$\Gamma \sim 1.0$	5.83	~0.60

*From $\sigma(90°)$ as $f(E_p)$

R.R.Henry, G.C.Phillips, C.W.Reich, J.L. Russell, Bull. Am. Phys. Soc. 1, No. 2, 96, N6 (1956).

F^{18} 9 9

Level $F^{19}(p,d)$ $E_p = 18.9$

8.5† g.s. $Q = -8.12$ *20*

†$\sigma(11°)$ in mb/sterad $l_n = 0$ p,d(θ)

J.B.Reynolds, K.G.Standing, Phys. Rev. 101, 158 (1956); 95, 639A (1954).

Levels	$O^{(16)}(He^3,p\gamma)$	$E_{He^3} = 2.0$
γ	0.94*	scin
	1.06*	2.10
	1.69	2.49

*$O^{18}(p,n\gamma)$ thresholds confirm these levels

J.W.Butler, H.D.Holmgren, W.E.Kunz, Bull. Am. Phys. Soc. 1, No. 1, 29, GA5 (1956); verbal report.

F^{18} 9 9

Levels	$O^{(16)}(d,n)$	$E_d = 1.8$ to 4.3; VdG
	9.5	10.4 thresh n,
	9.6	10.6 ~0°
	9.7 $J = 2^+, 3^{+*}$	10.8
	10.1	11.0
	10.3	11.2

*Increase of fast n's implies s wave to g.s.

J.B.Marion, R.M.Brugger, T.W.Bonner, Phys. Rev. 100, 46 (1955).

Level $O^{(16)}(d,\alpha)$ N^{14}2.31 level

~14.5 from resonance at $E_d \sim 7$

C.P.Browne, Phys. Rev. 100, 1253A (1955); verbal report.

F^{19} 9 10

Levels $F^{19}(p,p'\gamma)$ $E_p = 0.873$, 0.935

γ (0.109) $\alpha_K = 0.00210$ *45* E1 sl,

(0.197) $\alpha_K = 0.00191$ *60* E2 scin

Used K/L = 8; corrected for anisotropy

W.R.Mills, Jr., H.H.Hilton, III, C.A.Barnes, Phys. Rev. 100, 1794A (1955).

$F^{19}(p,p'\gamma)$ $\gamma\gamma(\theta,H)$

μ(0.197 level) = +3.4 *9* (g = −1.90 possible)

Gyromagnetic ratios of 1.35 and −1.90 fit data.

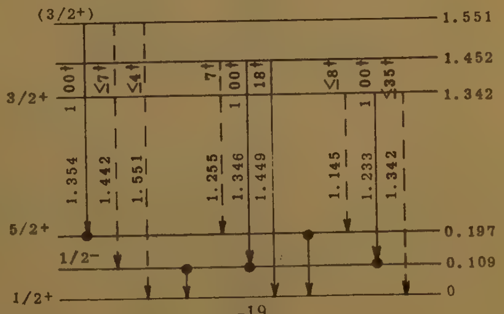
P.B.Treacy, Nature 176, 923 (1955).

γ	$F^{19}(p,p'\gamma)$	$E_p = 2.4$ to 4.1
	(0.110)	scin $\gamma\gamma$, scin pr
	(0.197)	1.346 *10*
	1.233 *10*	1.354 *10*
	1.255 ?	1.449 *10*

No 1.145 γ, 1.442 γ, 1.551 γ

(0.110 γ)(1.233, 1.346 γ) No (0.110 γ)(1.45 γ)

(0.197 γ)(1.354 γ) delay observed



F^{19}
9 10

†Relative number of transitions from level

B.J.Toppel, D.H.Wilkinson, D.E.Alburger, Phys. Rev. 100, 1254A (1955); 101, 1485 (1956).

F^{19} 9 10

Level $F^{19}(p,p'\gamma)$ $E_p = 4.3$

1.55 level

γ 1.35 *4* scin

$(1.35\gamma)(0.197\gamma)$ delay = $85^{m\mu s}$ (half life)

M. Fiehrer, P. Lehmann, A. Lévêque, R. Pick, Compt. rend. 241, 1746 (1955).

F^{20} 9 11

Capture γ's F^{19}(th n,γ) sπ pr

45†	4.07 *2*	22†	5.54 *2*
13†	5.10 *2*	15†	6.018 *11*
25†	5.28 *2*	29†	6.599 *11*

†Photons/100 F captures

P. J. Campion, G. A. Bartholomew, Bull. Am. Phys. Soc. 1, No. 1, 28, GA2 (1956); verbal report.

Levels $F^{19}(n,n)$ Li(p,n) n,n(θ)

E_o	Level	l_n	J
28	6.627	1	1^- or 2^-
50	6.648	1	1^-
99	6.694	1	1^-

R. C. Block, H. W. Newson, Bull. Am. Phys. Soc. 1, No. 1, 55, R3 (1956).

Levels $F^{19}(n,\alpha)7.4^sN^{16}$ $E_n = 3.0$ to 8.0

	9.8	90+	10.51 *5*
50+	10.03 *5*	170+	10.61 *5*
60+	10.11 *5*	190+	11.22 *5*
40+	10.18 *5*	270+	12.2 *1*

+Peak σ in mb

J. B. Marion, R. M. Brugger, Phys. Rev. 100, 69 (1955).

Levels $O^{18}(d,\alpha)$ $E_d = 0.7$ to 3.0

76†	13.59 *1*	$\Gamma \sim 0.50$
87†	13.90 *1*	~ 0.40
79†	14.25 *1*	~ 0.30
100†	14.94 *1*	> 0.60

N. A. Bostrom, E. L. Hudspeth, I. L. Morgan, Bull. Am. Phys. Soc. 1, No. 2, 94, M12 (1956).

F^{21} 9 12

Levels $F^{19}(t,p)$ $E_t = 1.8$

g.s $Q = 6.199$ *30* sd; 90°

0.269

1.087

1.694

2.036

N. Jarmie Bull. Am. Phys. Soc. 1, No. 1, 28, GA4 (1956); verbal report. Phys. Rev. 99, 1043 (1955).

Ne^{19} 10 9

Levels $F^{19}(p,n)$ $E_p = 4.2$ to 5.9; VdG

g.s. $Q = -4.022$ *5* thresh n, $\sim 0°$

0.241 *4*

0.280 *4*

No other level below 1.5

Graph of $\sigma(\sim 0°)$ given for n yield

J. B. Marion, T. W. Bonner, C. F. Cook, Phys. Rev. 100, 91 (1955).

Ne^{20} 10 10

Levels $F^{19}(d,n)$ $E_d = 9.06$ scin n d,n(θ)

Level	l_p
g.s.	0
(1.63)	2
~7.3	0 and 2
(9.3)	1

J. M. Calvert, A. A. Jaffe, E. E. Maslin, Proc. Phys. Soc. 68A, 1017 (1955).

Levels $Ne^{(20)}(p,p')$ $E_p = 18$ scin

1.63	7.45
4.26	7.85
4.97	9.20
5.81	10.0

p,p'(θ) studied for the above levels.

G. Schrank, G. K. O'Neill, Bull. Am. Phys. Soc. 1, No. 1, 29, GA7 (1956).

Levels $F^{19}(p,\gamma)$ sπ,p res. calibr.

13.193 $E_p = 0.3404$ *3*

13.698 $E_p = 0.8712$ *4*

F. Bumiller, H. H. Staub, Helv. Phys. Acta 28, 355A (1955).

Levels $F^{19}(p,\alpha\pi)$ $E_p = 1.3$ to 5.5 sl pr

15.86	$\Gamma \sim 0.16$		
16.06	= 0.09	16.60	$\Gamma = 0.27$
16.20	= 0.10	16.98	= 0.10

14 additional levels observed for above E_p

W. A. Ranken, J. H. McCrary, T. W. Bonner, Bull. Am. Phys. Soc. 1, No. 2, 95, N1 (1956).

Ne^{21} 10 11

$O^{18}(\alpha,n)$ Po α's, $E_\alpha = 2.4$ to 5

No resonances observed BF_3

R. R. Roy, A. Lagasse, M. L. Goes, R. Moerman, Compt. rend. 241, 1567 (1955).

Ne^{23} 10 13 40^s

β^- 3.9 *3* Na^{23}(fast n,p); scin

$\gamma(Na^{23})$

36% 0.440 *5* scin $\beta\gamma/\beta$

≤3.4% ~1.7

H. J. Gerber, M. G. Muñoz, D. Maeder, Helv. Phys. Acta 28, 478A (1955); Phys. Rev. 101, 774 (1956).

$Na^{22}_{11\ 11}$ Levels $F^{19}(\alpha,n)$ $E_\alpha = 8.15$

g.s.	Q = -2.0 *2*	a p-recoil
0.45 *20*		thresh n, ~0°
1.15 *20*		2.25 *20*
1.8 *2* ?		3.0 *2*

A.R.Quinton, W.T.Doyle, Phys. Rev. 101, 669 (1956); 97, 252A (1955).

Levels $Ne^{(20)}(d,p)$ $E_d = 0.8$ to 1.1

12.07 p's to Ne^{21} 0.35 level

12.13 p's to Ne^{21} 1.73 level

No resonance for p's to Ne^{21} 2.84 level a pc

S.Gorodetzky, T.Muller, M.Port, Compt. rend. 240, 1704, 2224 (1955).

$Na^{23}_{11\ 12}$ Level $Na^{23}(p,p')$ $E_p = 4.6$ to 5.6

0.437 *5* $s\pi$

J.P.Schiffer, C.R.Gossett, G.C.Phillips, T.E. Young, Bull. Am. Phys. Soc. 1, No. 2, 95, N2 (1956).

γ $Na^{23}(n,n'\gamma)$ $E_n = 5.1$

0.43	1.64	scin
0.66	2.07	

I.L.Morgan, Bull. Am. Phys. Soc. 1, No. 2, 96, N11 (1956); verbal report.

Level $Na^{23}(p,p'\gamma)$ $E_p = 1.288$

(0.440) $J = 5/2^{+*}$ $p,\gamma(\theta)$

*From $p,\gamma(\theta)$, assuming p- and f-wave protons and channel spin 2

R.W.Krone, W.G.Read, Bull. Am. Phys. Soc. 1, No. 4, 212 SA11 (1956).

Level $Na^{23}(p,p'\gamma)$

(0.440) $\tau < 14^{\mu\mu s}$ recoil

C.P.Swann, W.C.Porter, Bull. Am. Phys. Soc. 1, No. 1, 29, GA11 (1956); verbal report.

$Na^{24}_{11\ 13}$ 15^h β^- 1.400 $s\pi\beta,\beta\gamma$

F-K linear ($E_\beta > 0.450$)

E.F.De Haan, G.J.Sizoo, Physica 21, 818 (1955).

$\gamma(Mg^{24})$

(1.38)	4.01	scin
(2.75)	5.3	

F.M.Tomnovec, C.S.Cook, Phys. Rev. 100, 1254A (1955); verbal report.

$Na^{24}_{11\ 13}$ 15^h $\beta(1.38\gamma)$ delay = $25^{\mu\mu s}$ *17* scin

C.F.Coleman, Phil. Mag. 46, 1135 (1955).

$Na^{24}_{11\ 13}$ Resonance peak $Na^{23}(n,n)$ Li(p,n)

0.053 $J = 3^-$ or 2^-? $n,n(\theta)$

$l_n = 1$

R.C.Block, H.W.Newson, Bull. Am. Phys. Soc. 1, No. 1, 55, R3 (1956).

Resonance peaks $Na^{23}(n,n'\gamma)$ $E_n = 0.44$ to 0.80

0.542	scin 0.440γ
0.602*	0.710*
0.633$	0.780$

*n, γ isotropic $n, γ anisotropic

H.Hausman, J.E.Monahan, F.P.Mooring, S.Raboy, Bull. Am. Phys. Soc. 1, No. 1, 56, R7 (1956); verbal report.

$Na^{25}_{11\ 14}$ 62^s $\gamma(Mg^{25})$ $Mg^{(25)}$ (14-Mev p,n)

95†	0.40	100†	0.98	scin
98†	0.58	33†	1.61	

No β^- to 0.58 level in Mg^{25} (< 1% of β's)

H.E.Gove, A.E.Litherland, E.B.Paul, G.A. Bartholomew, Bull. Am. Phys. Soc. 1, No. 1, 29, GA8 (1956); verbal report.

$Mg^{24}_{12\ 12}$ Levels $Na^{23}(d,n)$ $E_d = 8.4$

0.04†	g.s.		ic p-recoil
0.2†	(1.368)		
0.4†	(4.122)	$l_p = 2$	
2†	(4.23)	$l_p = 0$	
0.32†	5.1		
0.32†	5.5		
3†	6.3		
4.3†	7.5	$l_p = 0$ and 2	
4.4†	8.4	$l_p = 0$	

†Peak σ in mb/sterad

J.M.Calvert, A.A.Jaffe, A.E.Litherland, E.E. Maslin, Proc. Phys. Soc. 68A, 1008 (1955).

Levels $Na^{23}(p,\gamma)$ $E_p \leq 0.53$; EA

	Level	E_p	Γ (kev)
1†	11.943	0.2508 *2*	0.3 *2*
110†	11.998	0.3078 *3*	0.8 *3*
2†	12.061	0.3735 *4*	2.0 *10*
4†	12.126	0.4438 *6*	0.8 *3*
65†	12.193	0.5109 *6*	0.8 *3*

†Relative γ yield

D.A.Hancock, F.Verdaguer, Proc. Phys. Soc. 68A, 1080 (1955).

Mg^{24} 12 12

Levels $Na^{23}(p,p)$ $E_p \le 1.5, 155°$; VdG

E_o	Level	Γ(kev)	Γ_p(kev)	J
0.797	12.477			
0.815	12.484			
0.878	12.544	8	6.8	1^+
0.922	12.586			
1.022	12.682	66 or 50	66 or 50	2^-
1.177	12.831	4	2.8	1^+
1.321	12.969			3^+
1.398	13.042	1	0.7	3^+
	$Na^{23}(p,\alpha)$	$E_p \le 1.5, 155°$;		VdG
1.288	12.937			
1.460	13.102			

N.P.Baumann, F.W.Prosser, Jr., R.W.Krone, Phys. Rev. 100, 1244A (1955); verbal report.

Mg^{25} 12 23

Levels $Mg^{25}(p,p'\gamma)$ E_p = 1.5 to 2.9

1.61 level

γ > 96% 1.61 scin

No 0.63γ, 1.03 γ (< 1%, 3% resp. of 1.61γ)

1.96 level

γ (0.40) 55% 1.38

(0.58) 28% 1.96

17% 0.98

(0.58γ)(0.40, 0.98, 1.38γ)

H.E.Gove, A.E.Litherland, E.B.Paul, G.A. Bartholomew, Bull. Am. Phys. Soc. 1, No. 1, 29, GA8 (1956); verbal report.

Capture γ's $Mg^{(24)}$(th n,γ) sπ pr

5† 2.816 *16*

1† 3.408 *18*

P.J.Campion, G.A.Bartholomew, Bull. Am. Phys. Soc. 1, No. 1, 28, GA2 (1956); verbal report.

Resonance Mg^{24}(n) E_n = 0.002 to 0.35

peak 60* 0.085 J = 3/2⁻ Li(p,n)

*σ_t(peak) Γ = 0.008

A.Taylor, H.Marshak, H.W.Newson, Bull. Am. Phys. Soc. 1, No. 1, 62 UA3 (1956); verbal report.

Resonance $Mg^{(24)}$(n,n) Li(p,n)

peak 0.085 J = 3/2⁻ n,n(θ)

l_n = 1

R.C.Block, H.W.Newson, Bull. Am. Phys. Soc. 1, No. 1, 55, R3 (1956).

Mg^{26} 12 14

Capture γ's $Mg^{(25)}$(th n,γ) sπ pr

8.55 *2* 10.08 *2*

8.93 *2* 11.086 *25*

*In addition to other known γ's

P.J.Campion, G.A.Bartholomew, Bull. Am. Phys. Soc. 1, No. 1, 28, GA2 (1956); verbal report.

Mg^{26} 12 14

Resonance Mg^{25}(n) E_n = 0.002 to 0.35

peaks 0.020 Γ ~0.001 Li(p,n)

0.081 ~0.009

0.101 ~0.010

A.Taylor, H.Marshak, H.W.Newson, Bull. Am. Phys. Soc. 1, No. 1, 62, UA3 (1956); verbal report.

Mg^{27} 12 15

Levels Al^{27}(n,p) E_n = 14; ppl

<0.2† g.s. several angles

1† 1.0

10† 3.5

5.7

†% of charged particles (p and d)

R.K.Haling, Bull. Am. Phys. Soc. 1, No. 1, 29, GA9 (1956); verbal report.

Resonance Mg^{26}(n) E_n = 0.002 to 0.35

peak ~0.320 Li(p,n)

A.Taylor, H.Marshak, H.W.Newson, Bull. Am. Phys. Soc. 1, No. 1, 62, UA3 (1956); verbal report.

Al^{25} 13 12

Capture γ's $Mg^{24}(p,\gamma)$ $E_p \le 1.66$; scin

0.45 level

γ 0.45

0.95 level J = 3/2⁺ p,$\gamma(\theta)$

γ 58† 0.50 42† 0.95

1.61 level J = 7/2⁺ p,$\gamma(\theta)$

γ ≥ 90† 1.61

1.81 level J = 5/2⁺ p,$\gamma(\theta)$

γ 30† 0.86

50† 1.36 20† 1.81

3.44 level J = 9/2⁺ p,$\gamma(\theta)$

γ ≥ 90† 1.61

90† 1.83 10† 3.44

(1.83γ)(1.61γ)

3.88 level J = 5/2⁺ p,$\gamma(\theta)$

γ 17† 1.18

2.07 ? 6† 3.43

67† 2.93 10† 3.88

G.A.Bartholomew, H.E.Gove, A.E.Litherland, E.B.Paul, Bull. Am. Phys. Soc. 1, No. 1, 28, GA1 (1956); verbal report; Phys. Rev. 99, 644A (1955).

Al^{26} 13 13 ~10^6y g.s.

$Si^{(28)}$(5-Mev d,α)

β^+ 1† 1.17 *5* ΔJ = 3, no shape scin

$\gamma(Mg^{26})$ ~1† 1.76 *10* scin

M.J.Laubitz, Proc. Phys. Soc. 68A, 1033 (1955).

Al^{26} 13 13

Level Al^{27}(p,d) E_p = 18; p,d(θ)

l_n = 2 for group to g.s., 0.22, or 0.42 level or all three

J.B.Reynolds, K.G.Standing, Phys. Rev. 101, 158 (1956); 95, 639A (1954).

$Al^{26}_{13\ 13}$ Level — $Si^{(28)}(d,\alpha)$ — E_d = 5.5 to 7.5 — s

0.228 *5*

Yield decreases from 62% of g.s. group at 15° to 0 beyond 60° for E_d = 7.03

C.P.Browne, Bull. Am. Phys. Soc. 1, No. 4, 212 SA13 (1956).

$Al^{27}_{13\ 14}$ Levels — $Al^{27}(p,p'\gamma)$ — recoil

(0.840) } $\tau < 70^{\mu\mu s}$
(1.010)

C.P.Swann, W.C.Porter, Bull. Am. Phys. Soc. 1, No. 1, 29, GA11 (1956).

γ — $Al^{27}(n,n'\gamma)$ — E_n = 3.7; scin

0.835 *10* $\sigma(90°)$ = 22 mb/sterad
1.02 *1* $\sigma(90°)$ = 41 mb/sterad
1.72 *2*
1.91 *2*
2.22 *3*

M.A.Rothman, H.S.Hans, C.E.Mandeville, Phys. Rev. 100, 83 (1955).

$Al^{28}_{13\ 15}$ Levels — $Al^{27}(d,p)$ — E_d = 6; 5° to 60° — s

Level	l_n	Level	l_n
g.s.	0		
0.031	0	3.347	0
1.017	2,0	3.461	1
2.143	0	3.591	1
2.663	2	3.669	0
3.294	0	3.704	0

Weak p groups corresponding to 11 levels below 3.59 approx. isotropic

H.A.Enge, W.W.Buechner, A.Sperduto, M.Mazari, Bull. Am. Phys. Soc. 1, No. 4, 212 SA12 (1956).

$Al^{27}(d,p\gamma)$ — time of flight

p(0.032γ) delay = $1.9^{m\mu s}$ *2*

J.C.Severiens, S.S.Hanna, Phys. Rev. 100, 1254A (1955); verbal report.

Resonance peak — $Al^{27}(n,n)$ — Li(p,n) n,n(θ)

0.090 J = 3 l_n = 0 or 1 ?

R.C.Block, H.W.Newson, Bull. Am. Phys. Soc. 1, No. 1, 55, R3 (1956).

$Al^{29}_{13\ 16}$ 6.6^m — $\gamma(Si^{29})$ 15† 1.28; 1† 2.43 — Si^{29}(14-Mev n,p); scin

No 1.15, 2.03γ

D.A.Bromley, H.E.Gove, A.E.Litherland, E.B.Paul, E.Almqvist, Bull. Am. Phys. Soc. 1, No. 1, 30, GA12 (1956).

$Si^{28}_{14\ 14}$ Levels — $Al^{27}(d,n)$ — E_d = 9.02 — ic p-recoil

		l_p
0.18*	g.s.	2
0.49+	1.78	0
0.21+	~4.7	
2.3+	~6.4	0
0.59+	7.10	
2.4+	7.55	0
5.9+	8.18	0
15+	9.16	0
1+	10.2	0

+mb/sterad at 0° *mb/sterad at 30° peak

J.M.Calvert, A.A.Jaffe, A.E.Litherland, E.E. Maslin, Proc. Phys. Soc. 68A, 1008 (1955).

Level γ — $Si^{(28)}(n,n'\gamma)$ — E_n = 0.35 to 3.9 — scin

1.78 *2*

R.B.Day, A.E.Johnsrud, D.A.Lind, Bull. Am. Phys. Soc. 1, No. 1, 56, R9 (1956); verbal report.

Level γ — $Si(n,n'\gamma)$ — E_n = 3.7; scin

1.78 *2* $\sigma(90°)$ = 60 mb/sterad

M.A.Rothman, H.S.Hans, C.E.Mandeville, Phys. Rev. 100, 83 (1955).

Level — $Al^{27}(p,\gamma)$ — sπ,p res. calibr.

12.545 E_p = 0.9908 *2*

F.Bumiller, H.H.Staub, Helv. Phys. Acta 28, 355A (1955).

γ — $Al^{27}(d,?\gamma)$ — E_d = 4.6 — sl pr

2.8†	6.9 *1*$		0.6†	8.75 *4*
2.4†	7.38 *6**		1.0†	9.08 *4*
2.3†	7.55 *6**		0.7†	9.45 *8*
1.9†	7.91 *4*		0.4†	9.87 *8*
0.8†	8.28 *4*		0.1†	10.7 *2*

†Average σ in mb for E_d = 2.7 to 4.6
May also belong to $$Mg^{25}, Al^{28}; *Al^{28}

R.D.Bent, T.W.Bonner, J.H.McCrary, W.A. Ranken, Phys. Rev. 100, 774 (1955).

$Si^{29}_{14\ 15}$ Levels — $Si^{(28)}(d,p)$ — E_d = 4.44 — s

g.s.	Q = 6.229 *40*
1.237	6.453
2.038	6.728
2.416	7.000
3.083	7.577
3.662	7.820
4.223?	8.354
4.931	8.832
5.944	9.112?
6.138?	

L.M.Khromchenko, Doklady Akad. Nauk SSSR 98, 761 (1954).

Si^{29} 14 15

Level $Si^{(29)}(n,n'\gamma)$ E_n = 0.35 to 3.9
γ 1.29 scin

R.B.Day, A.E.Johnsrud, D.A.Lind, Bull. Am. Phys. Soc. 1, No. 1, 56, R9 (1956); verbal report.

Level $Si^{29}(p,p'\gamma)$ E_p = 2.5 to 3.0
2.03 level J = 5/2$^+$ p,$\gamma(\theta)$

γ	1†	0.75	99†	2.03	scin
	1†	1.28			

(0.75γ)(1.28γ)

D.A.Bromley, H.E.Gove, A.E.Litherland, E.B. Paul, E.Almqvist, Bull. Am. Phys. Soc. 1, No. 1, 30, GA12 (1956).

γ $P^{31}(d,?\gamma)$ E_d = 4.6

4.1†	4.41 *4*	2.5†	6.11 *4*	sl pr
5.0†	4.71 *4*	1.6†	6.84 *4*	
5.0†	4.94 *4*	0.7†	7.46 *8*	
3.7†	5.29 *4*	0.4†	8.16 *4*	
3.5†	5.79 *4*	0.3†	8.53 *4*	

γ's may also be assigned to P^{32} or S^{32}
†Average σ in mb for E_d = 2.6 to 4.6

R.D.Bent, T.W.Bonner, J.H.McCrary, W.A. Ranken, Phys. Rev. 100, 774 (1955).

Resonance peaks $Si^{(28)}(n,n'\gamma)$ E_n = 0.35 to 3.9

1.9		scin 1.78γ
2.08	2.35	
2.27	2.45	

R.B.Day, A.E.Johnsrud, D.A.Lind, Bull. Am. Phys. Soc. 1, No. 1, 56, R9 (1956); verbal report.

Si^{30} 14 16

Level $Si^{(30)}(n,n'\gamma)$ E_n = 0.35 to 3.9
γ 2.19 scin

R.B.Day, A.E.Johnsrud, D.A.Lind, Bull. Am. Phys. Soc. 1, No. 1, 56, R9 (1956).

P^{31} 15 16

Level $P^{31}(p,p')$
1.264 *4* sd; 90°

D.M.Van Patter, C.P.Swann, W.C.Porter, C.E. Mandeville, Bull. Am. Phys. Soc. 1, No. 1, 39 JA1 (1956); verbal report.

Levels $Si^{30}(p,\gamma)$ E_p = 1.7 to 2.3

E_o	Level	J	
	1.26	3/2$^+$	p,$\gamma\gamma(\theta)$
	2.23	≥5/2$^+$	
1.73	8.96	3/2$^+$	p,$\gamma_o(\theta)$
1.82	9.05	3/2$^+$?	

E.B.Paul, G.A.Bartholomew, H.E.Gove, A.E. Litherland, Bull. Am. Phys. Soc. 1, No. 1, 39, JA2 (1956).

P^{32} 15 17

γ $P^{31}(d,?\gamma)$ E_d = 4.6
For possible γ's in P^{32} see Si^{29}, Bent et al.

S^{32} 16 16

Levels $P^{31}(d,n)$ E_d = 9.2

1.9†	g.s.	l_p = 0	ic p recoil
0.35†	2.25	l_p = 2	
1.3†	(3.81) (4.32) (4.50)	l_p = 0	
0.46†	(4.74) (5.04)		
1.2†	5.83	l_p = 2	

†Peak σ in mb/sterad
No 0.5, 1.5 levels

J.M.Calvert, A.A.Jaffe, A.E.Litherland, E.E. Maslin, Proc. Phys. Soc. 68, 1008 (1955).

γ $S^{(32)}(n,n'\gamma)$ E_n = 3.7; scin
2.25 *3*

M.A.Rothman, H.S.Hans, C.E.Mandeville, Phys. Rev. 100, 83 (1955).

γ $P^{31}(d,?\gamma)$ E_d = 4.6
For possible γ's in S^{32} see Si^{29}, Bent et al.

S^{33} 16 17

Levels $Cl^{(35)}(d,\alpha)$ E_d = 3.0 to 7.5

g.s.	Q = 8.277 *10*	s
0.844 *6*		
1.966 *7*	3.840 *9*	
2.312 *8*	3.947 *9*	
2.869 *8*	4.060 *9*	
2.938 *8*	4.105 *9*	
2.969 *8*	4.159 *9*	
3.227 *8*	4.224 *9*	
3.365 *8*	4.749 *10*	

No 4.42 level observed. See also S^{35}

C.H.Paris, W.W.Buechner, P.M.Endt, Phys. Rev. 100, 1317 (1955).

S^{34} 16 18

Levels $Cl^{(37)}(p,\alpha)$
g.s. Q = 3.015 *11* sd; 90°
2.129 *14*

D.M.VanPatter, C.P.Swann, W.C.Porter, C.E. Mandeville, Bull. Am. Phys. Soc. 1, No. 1, 39 JA1 (1956); verbal report.

S^{35} 16 19

Levels $Cl^{(37)}(d,\alpha)$ E_d = 3.0 to 7.5

g.s.	Q = 7.783 *12*	s
1.992* *10*	2.714 *10*	
2.348* *10*	4.025* *10*	

*From weak groups. Assignable to S^{33} or S^{35}

C.H.Paris, W.W.Buechner, P.M.Endt, Phys. Rev. 100, 1317 (1955).

S^{37} 16 21 5.0^{m}

β^- (90%) 1.6 $A^{(40)}(n,\alpha)$; scin
(10%) ~4.7
$\gamma(Cl^{37})$
100† 3.12
No other γ with $E_\gamma < 2$ (< 1†)

H.Morinaga, E.Bleuler, Bull. Am. Phys. Soc. 1, No. 1, 30, H2 (1956); verbal report.

Cl^{33} 17 16

Resonances $S^{(32)}(p,p)$ $E_p = 1.8$ to 4.0
62° to 167°; scin

E_o	Γ(kev)	J
1.900	8.5	$3/2^-$
2.30	52	$1/2^-$
2.575	≤5	
2.810	~6	$3/2^-$
2.902	≤5	
2.917	≤5	
3.092	≤4	$3/2^+, 5/2^+$
3.194	≤4	
3.265	32	$1/2^+$
3.381	≤4	$5/2^-, 7/2^-$
~3.5*	300	
3.718	≤4	

*Probably double

J.W.Olness, W.Haeberli, H.W.Lewis, Bull. Am. Phys. Soc. 1, No. 4, 212 SA14 (1956); verbal report.

Resonances $S^{(32)}(p,p'\gamma)$ $E_p = 2.7$ to 3.8
scin 2.2γ
2.810
2.902
2.917
3.094*
3.195*
3.379*
3.716*

*p,$\gamma(\theta)$ anisotropic, $\Gamma < 2$ kev

H.W.Lewis, J.W.Olness, W.Haeberli, Bull. Am. Phys. Soc. 1, No. 4, 213 SA15 (1956).

Cl^{35} 17 18

Levels $Cl^{(35)}(p,p')$ sd 90°
1.219 *5*
1.760 *4*

D.M. Van Patter, C.P.Swann, W.C.Porter, C.E. Mandeville, Bull. Am. Phys. Soc. 1, No. 1, 39, JA1 (1956); verbal report.

Levels $Cl^{35}(p,p')$ $E_p = 4.6$ to 5.6
sπ
1.220 *5*
1.766 *6*
No evidence for 0.7 level*

J.P.Schiffer, C.R.Gossett, G.C.Phillips, T.E. Young, Bull. Am. Phys. Soc. 1, No. 2, 95, N2 (1956); *verbal report.

Cl^{36} 17 19 3.1x10^{5y}

β^- 98.3% (0.714) CH_3Cl in pc
ϵ_K 1.7% (K x ray + e_{AK})/β = 0.017 *1*
No γ (< 10^{-2}%) scin, pc ce

R.W.P.Drever, A.Moljk, Phil. Mag. 46, 1337 (1955).

Cl^{36} 17 19

Levels $Cl^{(35)}(d,p)$ $E_d = 3.0$ to 7.5
s

g.s. Q = 6.354 *8*	
0.790 *5*	3.110 *8*
1.163 *6*	3.214 *8*
1.600 *7*	3.341 *8*
2.473 *7*	3.474 *8*
2.498 *7*	3.606 *8*
2.523 *7*	3.644 *8*
2.684 *7*	3.673 *8* Cl^{38}?
2.820 *7*	3.732 *8*
2.872 *7*	3.970 *8*
2.905 *7*	4.003 *8*
3.004 *7*	4.043 *8*

C.H.Paris, W.W.Buechner, P.M.Endt, Phys. Rev. 100, 1317 (1955).

Resonances $Cl^{(35)}(n)$ $E_n = 0.03$ to 15000 ev
-140 ev $\Gamma_n = 0.72$* ev $\Gamma_\gamma = 0.48$*
405 *6* $\Gamma_n = 0.14^\$$
8700 cryst, chopper

*Assuming J = 2 $From $\Gamma < 0.6$ and $\sigma_o > 580$

R.M.Brugger, J.E.Evans, E.G.Joki, R.S. Shankland, Bull. Am. Phys. Soc. 1, No. 4, 176 F11 (1956); verbal report.

Cl^{37} 17 20

Level $Cl^{37}(p,p')$ $E_p = 4.6$ to 5.6
1.713 *10* sπ

J.P.Schiffer, C.R.Gossett, G.C.Phillips, T.E. Young, Bull. Am. Phys. Soc. 1, No. 2, 95, N2 (1956).

Cl^{38} 17 21

Levels $Cl^{(37)}(d,p)$ $E_d = 3.0$ to 7.5
s

43†	g.s. Q = 3.877 *8*	
100†	0.672 *5*	1.620 *7*
	0.762 *5*	1.658 *7*
	1.312 *6*	1.693 *7*

†Relative intensity for $E_d = 5.6$, compatible with J = $2^-, 5^-$ for g.s., 0.672 levels resp.

C.H.Paris, W.W.Buechner, P.M.Endt, Phys. Rev. 100, 1317 (1955).

A^{35} 18 17 1.8^{s}

$Cl^{(35)}$(10-Mev p,n) chem
τ 1.83^{S} *2*
β^+ ~93% 4.96 *4* sl
$\gamma(Cl^{35})$
≤3% 1.19 *4* scin
≤3% 1.73 *4*

O.C.Kistner, A.Schwarzschild, B.M.Rustad, Bull. Am. Phys. Soc. 1, No. 1, 30, H3 (1956).

A^{37} 18 19 34^d

E_ϵ 0.812 *8* s Cl^{37} recoil
e_{AK} 65%
Charges 1 to 6 (av.= 2.6) found on recoils
Charge distribution and ϵ_L/ϵ_K value are discussed elsewhere*

O. Kofoed-Hansen, A. Nielsen, Kgl. Danske Videnskab. Selskab Mat.-fys. Medd. 29, No. 15 (1955); Phys. Rev. 96, 1045 (1954). *A. Winther, J. phys. radium 16, 562 (1955); R. A. Rubenstein, J. N. Snyder, Phys. Rev. 99, 189 (1955); P. Benoist-Gueutal, Ann. Phys. 8, 593 (1953).

E_ϵ 0.814 *2* s Cl^{37} recoil
Charges 1 to 7 (av.= 3.2) found on recoils

A. H. Snell, F. Pleasonton, Phys. Rev. 100, 1396; 98, 1174A; 97, 246 (1955).

ϵ scin γ continuum
High intensity of photons, $E_\gamma < 0.030$, supports theory of Glauber and Martin*

T. Lindqvist, C. S. Wu, Phys. Rev. 100, 145; 98, 231A (1955); *R. J. Glauber, P. C. Martin, Phys. Rev. 95, 572 (1954).

A^{41} 18 23 1.8^h

τ 1.8^h $A^{(40)}$(pile n,γ)
β^- 99.1% 1.199 *8* F-K linear ($E_\beta > 0.15$)
0.88% 2.48 4 $\Delta J = 2$, yes shape sl, sπ
$\gamma(K^{41})$ 1.290 *5* scin

A. Schwarzschild, B. M. Rustad, C. S. Wu, Bull. Am. Phys. Soc. 1, No. 1, 30, H4 (1956).

K^{40} 19 21 $1.3x10^{9y}$

ϵ/sec gm K = 3.1 ± 0.15 from K^{40}/A^{40} in micas of known age (Pb/U). Result insensitive to assumed value, β's/sec gm K = 27.S

L. T. Aldrich, G. W. Wetherill, G. L. Davis, G. R. Tilton, Bull. Am. Phys. Soc. 1, No. 1, 31, H5 (1956); verbal report.

3.50 ± 0.14 γ's/sec gm K scin
Absolute count (Pr^{142}, Co^{60}, Fe^{59} standards)

G. Backenstoss, K. Goebel, Z. Naturf. 10a, 920 (1955).

Ca^{47} 20 27 4.8^d

τ 4.5^d $Ca^{(48)}$ (14-Mev p,pn)
Ca^{46}(pile n,γ) chem
β^- 76% 0.70 *2* a $\beta\gamma$
24% 1.93 *20* a
$\gamma(Sc^{47})$ 5% 0.500 4π pc, scin
5% 0.812
71% 1.29
(0.70 β)(0.50, 0.81, 1.29 γ)
(0.50 γ)(0.81 γ) No (1.9 β)γ No γ(1.29 γ)

W. S. Lyon, T. H. Handley, Phys. Rev. 100, 1280 (1955).

Ca^{48} 20 28

$\tau_{\beta\beta}$ 38% Ca^{48}; 4π scin
$> 2x10^{18y}$ $\beta\beta$
$> 1.1x10^{18y}$ β
Search covered $2.5 < E_\beta < 4.25$ and $3.0 < E_\beta < 4.5$
Long τ suggests ν and anti-ν are nonidentical

M. Awschalom, Bull. Am. Phys. Soc. 1, No. 1, 31, H7 (1956); verbal report.

Ca^{49} 20 29 8.5^m

τ 8.9^m *2* Ca^{48}(pile n,γ)
β^- ~1.0 a $\beta\gamma$
2.12 *10* No 5.2 β (≤ 1%) a
$\gamma(Sc^{49})$ 89% 3.07 *5* scin
10% 4.04 *6*
0.80% ~4.7 No ~1.0 γ
(2.1 β)(3.07 γ) (~1.0 β)(4.04 γ)
No (3.07 γ) γ (< 3% of 3.07 γ)

D. W. Martin, S. B. Burson, J. M. Cork, Phys. Rev. 100, 1236A (1955); verbal report.

Sc^{42} 21 21 0.6^s

τ 0.62^s *5* $K^{(39)}$(18-Mev α,n)
β^+ Several Mev scin
Yield too large for Ti^{43} production from Ca impurity. τ fits systematics for $0^+ \to 0^+$

H. Morinaga, Phys. Rev. 100, 431 (1955).

Sc^{44} 21 23 4.0^h g.s.

$K^{(41)}$(19-Mev α,n) chem
β^+ 93.2† 1.471 *5* sl $\beta\gamma/\gamma$
F-K linear ($E_\beta > 0.200$)
$\gamma(Ca^{44})$ scin
100† 1.159 *3* $\alpha = 6.3x10^{-5}$ sl ce
0.12† 2.54 *3*
(1.47 β)(1.16 γ) sl, scin
No 1.38 γ (≲ 0.5†)
Intensity of e's with E < 0.15 compatible with value expected for atomic excitation

J. W. Blue, E. Bleuler, Phys. Rev. 100, 1324; 99, 659A (1955).

Sc^{44} 21 23 2.4^d

γ (0.271) α = 0.139 *3* sl ce, scin

J. W. Blue, E. Bleuler, Phys. Rev. 100, 1324; 99, 659A (1955).

Sc^{45} 21 24

Levels Sc^{45}(n,n'γ) E_n = 0.35 to 3.9
γ 0.36 0.97 scin
0.53 1.23
0.72 1.41

R. B. Day, A. E. Johnsrud, D. A. Lind, Bull. Am. Phys. Soc. 1, No. 1, 56, R9 (1956).

Sc^{47} 21 26 3.43^d

$Ti^{(48)}$(γ,p) chem
β^- 64% 0.430 *5* sl $\beta\gamma$
36% 0.596 *10* sl
γ 0.167 *2* scin
(0.430 β)γ No ce

R. T. Nichols, E. N. Jensen, Phys. Rev. 100, 1407 (1955).

Sc^{50} 21 29 1.7^m	τ		1.74^m *4*	Ti^{50}(fast n,p)
	β^-	~1†	~3.5	scin
	$\gamma(Ti^{50})$	~1†	1.17	scin
		1†	1.59	
	$(1.17\gamma)(1.59\gamma)$			Σscin

H.Morinaga, E.Bleuler, Phys. Rev. 100, 1236A (1955); verbal report.

Ti 22	Capture γ's	Ti(th n,γ)	
		0.334 *6*	scin Cp
		1.39 *2*	
		1.75 *4*	

Also unresolved γ's with $1.06 < E_\gamma < 1.10$ and $1.53 < E_\gamma < 1.58$

Study covered $E_\gamma = 0.1$ to 2.5

M.Reier, M.H.Shamos, Phys. Rev. 100, 1302 (1955); 95, 636A (1954).

Ti^{45} 22 23	Levels	Sc^{45}(p,n)	$E_p = 2.9$ to 5.5; VdG
		Level	thresh n, ~0°
		g.s. Q = −2.844 *4*	
		0.743 *11*	
		1.194 *8*	
		1.347 *10*	
		1.460 *11*	
		1.876 *10*	
		2.016 *13*	
		2.430 *11*	
		2.555 *8*	

Graph of σ(~0°) given for n yield

R.M.Brugger, T.W.Bonner, J.B.Marion, Phys. Rev. 100, 84 (1955).

V^{50} 23 27	Level	$V^{50}(\alpha,\alpha'\gamma)$		$E_\alpha = 4.4$
	γ	0.226	ϵB(E2) = 0.011	scin

L.W.Fagg, E.H.Geer, E.A.Wolicki, Bull. Am. Phys. Soc. 1, No. 4, 165 C4 (1956); verbal report.

Level	$V^{50}(\alpha,\alpha'\gamma)$		$E_\alpha = 6.5$
γ	0.225	ϵB(E2) = 0.011	scin

N.P.Heydenburg, G.M.Temmer, Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956); verbal report.

V^{51} 23 28	Level	$V^{(51)}(\gamma,\gamma)$		Cr^{51} recoil
		(0.320)	$\tau = 100^{\mu\mu s}$ *20*	σ

H.Schopper, Z.Phys. 114, 476 (1956).

Levels	$V^{(51)}$ (p,p′)	$E_p = 6.005, 7.420$
	0.322 *2*	s 90°,130°
	0.931 *3*	
	1.614 *5*	
	1.819 *5*	

No evidence for levels at 0.48, 1.16

W.W.Buechner, C.M.Braams, A.Sperduto, Phys. Rev. 100, 1387 (1955).

V^{52} 23 29	Capture γ's	$V^{(51)}$(th n,γ)	
		0.43 *2*	scin Cp
		0.64 *2*	
		~0.82 double?	

Study covered $E_\gamma = 0.1$ to 2.5

M.Reier, M.H.Shamos, Phys. Rev. 100, 1302 (1955); 95, 636A (1954).

Cr 24	Levels	Cr(n,n′)	$E_n = 4.3$; scin pulsed n's, 90°
		1.4	
		2.5	
		2.9	
		3.1 ?	

R.V.Smith, Bull. Am. Phys. Soc. 1, No. 4, 175 F2 (1956); verbal report.

Capture γ's	Cr(th n,γ)			
	0.740 *20*	1.07 *6*	scin Cp
	0.815 *16*	2.13 *5*	

Study covered $E_\gamma = 0.1$ to 2.5

M.Reier, M.H.Shamos, Phys. Rev. 100, 1302 (1955); 95, 636A (1954).

Cr^{48} 24 24 24^h	τ		23^h *1*		Ni(380-Mev p)	chem
	$\gamma(V^{48})$	95†	0.116 *2*	$\alpha = 0.02$	M1	scin,
		100†	0.305 *10*	$\alpha = 0.006$	E2	sl ce
	No β^+ (<2† from $\gamma^\pm$<1†)					scin
	No 0.420γ (<2†)		No other γ			
	$(0.116\gamma)(0.305\gamma)$		p $16^d V^{48}$			

R.van Lieshout, D.H.Greenberg, L.A.Ch.Koerts, C.S.Wu, Phys. Rev. 100, 223; 98, 1171 (1955).

Cr^{51} 24 27 27^d				$Cr^{(50)}$(pile n,γ) chem
	E_ϵ		0.780 *50*	scin γ continuum
	$\gamma(V^{51})$	7%	(0.320)	$(0.320\gamma)/(\gamma$ continuum)

S.G.Cohen, S.Ofer, Phys. Rev. 100, 856 (1955).

			$Cr^{(50)}$(pile n,γ) chem
E_ϵ	(92.2%)	0.756 *5*	γ continuum
$\gamma(V^{51})$			scin
	9.8%	(0.320)	$(0.320\gamma)/(K$ x ray)
	0.026%	0.624 *5*	

A.Bisi, E.Germagnoli, L.Zappa, Nuovo. cim. 2, 1052 (1955).

$\gamma(V^{51})$	(0.320)	$\alpha = 0.0031$ *2*	E2	GM

I.V.Estulin, E.M.Moiseeva, Soviet Phys. JETP 1, 463 (1955); Zhur. Ekspt'l i Teoret. Fiz. 28, 541 (1955).

Cr^{52} 24 28

Levels	$Cr^{(52)}(n,n')$	$E_n = 4.4$
37†	g.s.	ppl p-recoil
14†	(1.45)	
~5†	(2.43)	
~14†	(3.13)	

†$\sigma(90°)$ in mb/sterad

J.B.Weddell, B.Jennings, Bull. Am. Phys. Soc. 1, No. 1, 55, R5 (1956); verbal report.

Resonance peaks — $V^{51}(p,n)$ — $E_p = 1.55$ to 1.68

E_o $	E_o $
1.568*	1.629*
1.573*	1.637*
1.575	1.651
1.592**	1.658*
1.598**	1.669*
1.603*	1.672
1.607*	
1.617*	Threshold = 1.5656 *15*

*p,n(θ) isotropic **p,n(θ) anisotropic

$$E_p$ values for isolated resonances

J.H.Gibbons, R.L.Macklin, H.W.Schmitt, Phys. Rev. 100, 167 (1955).

Cr^{53} 24 29

Resonance peaks	$Cr^{(52)}(n,n)$	Li(p,n); n,n(θ)	
	0.058	$J = 1/2^+$	$l_n = 0$
	0.100	$= 1/2^+$	$= 0$

R.C.Block, H.W.Newson, Bull. Am. Phys. Soc. 1, No. 1, 55, R3 (1956).

Mn^{54} 25 29 291^d g.s.

E_ϵ 0.528 *20* x(continuum γ)

R.G.Jung, M.L.Pool, Bull. Am. Phys. Soc. 1, No. 4, 172 E11 (1956).

Mn^{55} 25 30

Level	$Mn^{55}(\alpha,\alpha'\gamma)$		$E_\alpha = 3$
	0.128 level	$J = 7/2^-$	p,γ(θ)
γ	(0.128)	$\alpha_K = 0.0144$ *30**	s ce
		M1 (≥ 98%)	

*From $(\alpha_K\ 0.137\gamma\ Ta^{181})/(\alpha_K\ 0.128\gamma\ Mn^{55}) = 125$ *25*

E.M.Bernstein, H.W.Lewis, Phys. Rev. 100, 1367 (1955).

Mn^{56} 25 31 2.6^h

$\gamma(Fe^{56})$		Mn^{55}(th n,γ); scin
	0.845 *6*	
	1.809 *9*	
	2.134 *11*	

M.G.Muñoz, D.Maeder, Helv. Phys. Acta 28, 359A (1955).

Mn^{56} 25 31

Capture γ's — Mn^{55}(th n,γ) — scin Cp

0.098 *5*	0.266 *15*
0.206 *10*	0.308 *15*

Study covered $E_\gamma = 0.1$ to 2.5

M.Reier, M.H.Shamos, Phys. Rev. 100, 1302 (1955); 95, 636A (1954).

Mn^{56} 25 31

Resonances — $Mn^{55}(n)$ — $E_n = 0.175$ to 10 kev

σ(peak)	E_o(kev)	Γ(ev)	J	chopper
2830	0.337 *3*	21.5	2	
	1.08 *2*	14.4	3	
702	2.36 *6*	340	3	
	7.50			

Γ_γ assumed to be 0.6 ev

L.M.Bollinger, D.A.Dahlberg, R.R.Palmer, G.E.Thomas, Phys. Rev. 100, 126 (1955); 95, 645A (1954).

Fe 26

Levels	Fe(n,n')	$E_n = 4.3$; scin pulsed n's
	g.s.	
	0.8	
	2.2	
	3.1	

R.V.Smith, Bull. Am. Phys. Soc. 1, No. 1, 55, R6 (1956); verbal report.

Capture γ's — Fe(th n,γ)

0.355 *8* scin Cp

Also unresolved γ's with $1.55 < E_\gamma < 1.68$

Study covered $E_\gamma = 0.1$ to 2.5

M.Reier, M.H.Shamos, Phys. Rev. 100, 1302 (1955); 95, 636A (1954).

Fe^{54} 26 28

Levels	$Fe^{(54)}(p,p')$	$E_p = 7.04$
	1.41	sd; 30°, 130°
	2.54	3.16
	2.57	3.34

W.W.Buechner, A.Sperduto, Bull. Am. Phys. Soc. 1, No. 1, 39, JA3 (1956).

Fe^{55} 26 29

Levels	$Fe^{54}(d,p)$		$E_d = 6.54, 7.01$
	g.s.	Q = 7.073	s; 10°, 45°
	0.413		
	0.932		
	1.413		

Many levels observed between 1.93 and 4

A.Sperduto, W.W.Buechner, Bull. Am. Phys. Soc. 1, No. 4, 223 W4, 311 (1956).

Levels	$Mn^{55}(p,n)$	$E_p = 1.7$ to 3.9
	0.925 *5*	thresh n, ~0°
	1.327 *9*	
	2.165 *15*	

R.A.Chapman, J.B.Marion, J.C.Slattery, Bull. Am. Phys. Soc. 1, No. 2, 95, N3 (1956); verbal report.

Fe^{56} 26 30

Levels	$Fe^{(56)}(n,n')$	$E_n = 6.5$
13†	g.s.	ppl p-recoil
6†	0.85	
3†	2.09	

†$\sigma(90°)$ in mb/sterad

J.B.Weddell, B.Jennings, Bull. Am. Phys. Soc. 1, No. 1, 55, R5 (1956); verbal report.

Fe^{56} 26 30

Level $Fe^{(56)}(n,n'\gamma)$ $E_n = 2.45$
(0.850) pulsed n's

$\sigma(\theta)$ not symmetric about 90°

$\sigma(90°) = 85$ *3* mb/sterad

L.Cranberg, J.S.Levin, Bull. Am. Phys. Soc. 1, No. 1, 56 R10 (1956); verbal report; Phys. Rev. 100, 434 (1955).

Levels $Fe^{(56)}(p,p')$ $E_p = 7.04$

0.85	sd; 30°, 130°
2.08	3.12
2.66	3.37
2.94	3.45
2.96	3.60

W.W.Buechner, A.Sperduto, Bull. Am. Phys. Soc. 1, No. 1, 39, JA3 (1956); verbal report.

γ $Fe^{(56)}(n,n'\gamma)$ $E_n = 3.7$; scin

0.845 *10* $\sigma(90°) = 135$mb/sterad
1.23 *1*
1.80 *2* $\sigma(90°) = 24$mb/sterad
2.10 *3*

M.A.Rothman, H.S.Hans, C.E.Mandeville, Phys. Rev. 100, 83 (1955).

Fe^{57} 26 31

Levels $Fe^{56}(d,p)$ $E_d = 6.54, 7.01$
g.s. Q = 5.418 s; 10°, 45°
0.015
0.135
0.365

Many levels observed between 0.36 and 6.5

A.Sperduto, W.W.Buechner, Bull. Am. Phys. Soc. 1, No. 4, 223 W4 (1956).

Fe^{57} 26 31

Level $Fe^{(57)}(p,p')$ $E_p = 7.04$
0.36 sd; 30°, 130°

W.W.Buechner, A.Sperduto, Bull. Am. Phys. Soc. 1, No. 1, 39, JA3 (1956); verbal report.

Fe^{58} 26 32

Levels $Fe^{57}(d,p)$ $E_d = 6.54, 7.01$
g.s. Q = 7.808 s; 10°, 45°
0.799
1.664
2.125

Many levels observed between 2.04 and 8.30

A.Sperduto, W.W.Buechner, Bull. Am. Phys. Soc. 1, No. 4, 223 W4; No. 6, 311 (1956).

Fe^{59} 26 33

Levels $Fe^{58}(d,p)$ $E_d = 6.54, 7.01$
g.s. Q = 4.350 s; 10°, 45°
0.286
0.473
0.728

Many levels observed between 0.73 and 6.20

A.Sperduto, W.W.Buechner, Bull. Am. Phys. Soc. 1, No. 4, 223 W4 (1956).

Co^{56} 27 29

ground state
J 4 para
$|\mu|$ 3.855 *7*
From $\mu(Co^{59})/\mu(Co^{56}) = 1.205$ *2*

R.V.Jones, W.Dobrowolski, C.D.Jeffries, Phys. Rev. 102, 738 (1956).

ground state
$|\mu|$ 2.6 *2* from $|g| = 0.66$ *4* $\gamma(\theta,T)$

R.C.Sapp, Bull. Am. Phys. Soc. 1, No. 2, 91, L1 (1956).

Co^{56} 27 29 77^d

β^+ 1.47 *3* sl
$\gamma(Fe^{56})$ scin

		15†	2.02
100†	0.845		2.06
10†	1.03 ?	20†	2.6
65†	1.24	2†	2.99
20†	1.75	15†	3.25

No 0.440, 0.977 β (< 2% of 1.47 β)

J.D.Kurbatov, H.J.Sathoff, Jr., K.Hisatake, M.Sakai, Bull. Am. Phys. Soc. 1, No. 4, 162 B5 (1956); verbal report.

$\gamma(Fe^{56})$ $Fe^{(56)}(p,n)$ scin

100†	0.85		
76†	1.20	19.8†	2.55
18†	1.71	1.6†	~3.0
13†	2.00	14†	3.25

$(0.85\gamma)/\beta^+ = 3.8$

C.S.Cook, F.M.Tomnovec, Bull. Am. Phys. Soc. 1, No. 1, 31, H8 (1956); verbal report

Co^{57} 27 30 270^d

E_ϵ 0.434 *30* x(continuum γ)

R.G.Jung, M.L.Pool, Bull. Am. Phys. Soc. 1, No. 4, 172 E11 (1956).

No β^+ (< 0.1%) d 36^hNi; scin
$(0.123\gamma)(0.014\gamma)$ delay = $101^{m\mu s}$ *5*

W.C.Middelkoop, A.Heyligers, L.H.Th.Rietjens, H.J.Van den Bold, P.M.Endt, Physica 21, 897 (1955).

$Fe^{(56)}(d,n)$ chem

$\gamma(Fe^{57})$		K/L	L/M	sd ce
1*	0.01437 *1*	8.93	9.1	
49.6*	0.12194 *3*	6.7		
	0.13631 *3*	8.2		

*Relative ce_K intensity

J.Bellicard, A.Moussa, Compt. rend. 241, 1202 (1955).

Co^{58} 27 31 72^d g.s.
$\gamma(Fe^{58})$ scin
1.6† (0.81) E2/M1 = 4.8 $\gamma\gamma(\theta)$
100† (0.81) E2 = 100%
0.5† 1.62
$(0.81\gamma)(0.81\gamma)(\theta)$ J = 2, 2, 0

A. Rossi, H. Frauenfelder, N. Levine, S. Singer, Bull. Am. Phys. Soc. 1, No. 4, 163 B6 (1956).

$\gamma(Fe^{58})$ $Ni^{(58)}$(pile n,p) chem scin
100† (0.81)
0.5† 1.64 *4*

B. L. Robinson, R. W. Fink, Bull. Am. Phys. Soc. 1, No. 1, 40, JA7 (1956); verbal report.

Co^{59} 27 32
Levels $Co^{59}(n,n')$ E_n = 4.3; scin pulsed n's, 90°
1.2
1.8
3.1

R. V. Smith, Bull. Am. Phys. Soc. 1, No. 4, 175 F2 (1956); verbal report.

Co^{60} 27 33
<u>ground state</u>
μ **positive**
From circular polarization of γ's from polarized Co^{60}

J. C. Wheatley, W. J. Huiskamp, A. N. Diddens, M. J. Steenland, H. A. Tolhoek, Physica 21, 841 (1955).

Co^{60} 27 33 5.2^y
$\gamma(Ni^{60})$ Co^{59}(pile n,γ) chem sd pe
0.0012% 2.158

J. L. Wolfson, Can. J. Phys. 33, 886 (1955).

Co^{60} 27 33
Capture γ's Co^{59}(th n,γ) scin Cp
0.237 *5*
0.289 *10* 0.82 *2*
0.43? 1.48 *4*
0.65 *2* 1.82 *4*
Study covered E_γ = 0.1 to 2.5

M. Reier, M. H. Shamos, Phys. Rev. 100, 1302 (1955); 95, 636A (1954).

Co^{61} 27 34 1.7^h
$Cu^{(65)}$(31.5-Mev γ,α) chem
τ 1.75^h *15*
$\gamma(Ni^{61})$ 0.072 *3* scin
$\gamma/\beta^- \sim 1$ No 0.50γ (<5%) No other γ

P. Erdös, P. Jordan, D. Maeder, P. Stoll, Helv. Phys. Acta 28, 323A (1955).

Ni 28
Levels $Ni(n,n')$ E_n = 4.3; scin pulsed n's, 90°
1.4
2.1
2.5
2.9

R. V. Smith, Bull. Am. Phys. Soc. 1, No. 4, 175 F2 (1956); verbal report.

Ni^{58} 28 30
Levels $Ni^{(58)}(p,p')$ E_p = 4.580, 5.283 sπ
1.153* *10* 2.275* *10*
1.453 *5* 2.776* *10*
*Assignment uncertain; calculation of energy based on A = 58

R. R. Spencer, G. C. Phillips, J. P. Schiffer, T. E. Young, Bull. Am. Phys. Soc. 1, No. 2, 95, M13 (1956); verbal report.

Level $Ni^{(58)}(p,p'\gamma)$ E_p = 2.5 to 4.5
γ (1.45) $\tau < 0.2^{\mu\mu s}$ scin

M. S. Moore, J. P. Schiffer, C. M. Class, Bull. Am. Phys. Soc. 1, No. 1, 39, JA4 (1956); verbal report.

γ $Ni^{58}(n,n'\gamma)$ E_n = 4.4 scin
33† 1.01 *1*
100† 1.46 *2*

R. M. Sinclair, Bull. Am. Phys. Soc. 1, No. 1, 42, K3 (1956); verbal report.

Ni^{59} 28 31
Levels $Co^{59}(p,n)$
0.343 2.15 thresh n
1.22 2.55
1.343 2.66
1.79
1.96

J. W. Butler, C. R. Gossett, H. D. Holmgren, Bull. Am. Phys. Soc. 1, No. 4, 163 B8 (1956); verbal report.

Ni^{60} 28 32
Levels $Ni^{(60)}(p,p')$ E_p = 4.580, 5.283 sπ
1.330 *5*
2.156 *10*

R. R. Spencer, G. C. Phillips, J. P. Schiffer, T. E. Young, Bull. Am. Phys. Soc. 1, No. 2, 95, M13 (1956); verbal report.

Level $Ni^{60}(\gamma,\gamma)$ $Co^{60}Cl_2$ at 1150°C
γ (1.33) $\tau = 0.52^{\mu\mu s}$ *8*
J = 2 $\gamma\gamma(\theta)$
Studied decrease of resonance fluorescence with increasing thickness of Ni absorber placed between source and Ni scatterer

P. R. Metzger, Bull. Am. Phys. Soc. 1, No. 1, 40, JA6 (1956); verbal report.

Ni^{60} 28 32

Resonances $Co^{59}(p,\gamma)$ $E_p = 1.0$ to 1.9
150 resonances observed for $E_\gamma \geq 4$
g.s. γ not observed (<5% of γ to 1.33 level)

C.R.Gossett, J.W.Butler, H.D.Holmgren, Bull. Am. Phys. Soc. 1, No. 4, 223 W5 (1956); verbal report.

Ni^{61} 28 33

Levels $Ni^{61}(\alpha,\alpha'\gamma)$ $E_\alpha = 4.4$

γ	0.066	$\epsilon B(E2) = 0.00038$	scin
	0.282	$= 0.00090$	
	0.657	$= 0.0090$	

L.W.Fagg, E.H.Geer, E.A.Wolicki, Bull. Am. Phys. Soc. 1, No. 4, 165 C4 (1956); verbal report.

Cu 29

Capture γ's Cu(th n,γ)
0.202 *10* scin Cp
0.280 *10*
Study covered $E_\gamma = 0.1$ to 2.5

M.Reier, M.H.Shamos, Phys. Rev. 100, 1302 (1955); 95, 636A (1954).

Cu^{59} 29 30 81^s

τ		81^s *1*	$Ni^{(58)}$(4-Mev d,n)		
β^+	100†	3.70 *10*			s
$\gamma(Ni^{59})$			10†	1.28 *2*	scin
	~3†	0.33 *2*	1.8†	1.67 *4*	
	11†	0.865 *15*	~0.3†	2.07 *5*	

$\gamma^{\pm}$(0.33, 0.865, 1.28γ)
No (0.865 γ)(1.28 γ)

F.W.Prosser,Jr., M.S.Moore, J.P.Schiffer, Bull. Am. Phys. 1, No. 4, 163 B7; verbal report; No. 1, 39 JA4 (1956).

Ni^{58}(5.5-Mev d,n)
β^+ $\geq 95\%$ GM
ϵ $\leq 5\%$ pc (K x ray)/$\beta^+ \sim 0.015$
No γ with $0.08 < E_\gamma < 0.50$ (<0.5% of β^+) scin

T.Yuasa, G.A.Renard, J. phys. radium, 16, 889 (1955).

$\gamma(Ni^{59})$	0.19 ?	Ni^{58}(1.84 - Mev p,γ)
	0.35	1.31 scin
	0.87	1.80

J.W.Butler, C.R.Gossett, H.D.Holmgren, Bull. Am. Phys. Soc. 1, No. 4, 163 B8 (1956).

Cu^{59} 29 30

Resonance peaks $Ni^{58}(p,\gamma)$ $E_p = 0.6$ to 1.8 scin, Cu^{59} $\gamma^{\pm}$

0.855	
0.947	
1.009	1.375
1.099	1.423
1.226	1.521
1.307	1.539
1.315	1.581

C.R.Gossett, J.W.Butler, H.D.Holmgren, Bull. Am. Phys. Soc. 1, No. 1, 40, JA5 (1956).

Cu^{61} 29 32

Resonance peaks $Ni^{60}(p,\gamma)$ $E_p = 0.6$ to 1.8 scin

0.725	1.247	1.431	
0.895	1.313	1.451	
1.029	1.319	1.461	
1.066	1.323	1.465	
1.078	1.331	1.483	1.567
1.132	1.343	1.491	1.578
1.167	1.347	1.515	1.589
1.197	1.371	1.519	1.600
1.209	1.381	1.529	1.607
1.239	1.415	1.539	1.620

Γ< 1 kev for all peaks

C.R.Gossett, J.W.Butler, H.D.Holmgren, Bull. Am. Phys. Soc. 1, No. 1, 40, JA5 (1956).

Cu^{63} 29 34

Levels $Cu^{63}(n,n'\gamma)$ $E_n = 4.4$

γ	4†	0.65 *1*	6†	1.34 *3*	scin
	10†	0.97 *1*	2†	1.43 *5*	

R.M.Sinclair, Bull. Am. Phys. Soc. 1, No. 1, 42, K3 (1956); verbal report.

Cu^{65} 29 36

Level $Cu^{65}(n,n'\gamma)$ $E_n = 4.4$
γ 9† 1.12 *2* scin
†Relative to 0.97 γ from same reaction on Cu^{63}

R.M.Sinclair, Bull. Am. Phys. Soc. 1, No. 1, 42, K3 (1956); verbal report.

Zn^{63} 30 33

Levels $Cu^{63}(p,n)$ $E_p = 4.2$ to 5.3; VdG

Level	thresh n, ~0°
g.s.	Q = -4.149 *4*
0.191 *11*	
0.642 *11*	
1.043 *15*	

Graph of $\sigma(\sim 0°)$ given for n yield

R.M.Brugger, T.W.Bonner, J.B.Marion, Phys. Rev. 100, 84 (1955).

Zn^{65} 30 35

Levels $Cu^{(65)}(p,n)$ $E_p \sim 2.9$
100+ g.s. Q = -2.131 *5*
100+ 0.118 *8*
0.052, 0.092 levels not observed (< ~20†)
n resonances in S used to select E_n

J.B.Marion, R.A.Chapman, Phys. Rev. 100, 1795A (1955); 101, 283 (1956).

Levels $Cu^{65}(p,n)$ $E_p = 2.1$ to 4.1; VdG

Level	thresh n, ~0°
g.s.	Q = -2.136 *4*
0.78 *3*	
1.26 *3*	
1.93 *2*	

No indication of 0.052, 0.092, 0.114 levels
Graph of $\sigma(\sim 0°)$ given for n yield

R.M.Brugger, T.W.Bonner, J.B.Marion, Phys. Rev. 100, 84 (1955).

Ga^{66} 31 35 9.4^h

$\gamma(Zn^{66})$ — $Zn^{(66)}$(22-Mev d, 2n), scin pr

1.89	3.35	scin pr
2.14	3.76	
2.38	4.14	
2.73	4.27	
3.23	4.78	

D.E. Alburger, B.J. Toppel, Phys. Rev. 100, 1357 (1955).

Ga^{67} 31 36

Levels — Zn^{67}(p, n) — E_p = 1.8 to 3.9, thresh n, ~0°

g.s.	
0.357 *7*	1.235 *15*
0.857 *20*	1.544 *20*

R.A. Chapman, J.B. Marion, J.C. Slattery, Bull. Am. Phys. Soc. 1, No. 2, 95, N3 (1956); verbal report.

Ga^{68} 31 37

Levels — $Zn^{(68)}$(p, n) — E_p = 2.7 to 4.3, thresh n, ~0°

Level	
g.s.	Q = -3.694 *6*
0.170 *9*	

R.M. Brugger, T.W. Bonner, J.B. Marion, Phys. Rev. 100, 84 (1955).

Levels — Zn^{68}(p, n) — E_p = 3.6 to 5.3, thresh n, ~0°

g.s.	
0.189 *8*	
0.344 *9*	1.112 *23*
0.578 *12*	1.234 *23*
0.854 *17*	1.586 *23*

R.A. Chapman, J.R. Marion, J.C. Slattery, Bull. Am. Phys. Soc. 1, No. 2, 95, N3 (1956); verbal report.

Ga^{69} 31 38

Level — $Ga^{69}(\alpha,\alpha'\gamma)$ — E_α = 4.8

γ 0.324 $\epsilon B(E2)$ = 0.0079 scin

L.W. Fagg, E.H. Geer, E.A. Wolicki, Bull. Am. Phys. Soc. 1, No. 4, 165 C4 (1956); verbal report.

Ga^{71} 31 40

Level — $Ga^{71}(\alpha,\alpha'\gamma)$ — E_α = 4.4

γ 0.513 $\epsilon B(E2)$ = 0.012 scin

L.W. Fagg, E.H. Geer, E.A. Wolicki, Bull. Am. Phys. Soc. 1, No. 4, 165 C4 (1956); verbal report.

Ga^{72} 31 41 14^h

$\gamma(Ge^{72})$ — $Ga^{(71)}(n,\gamma)$ scin

≤0.8†	0.32 *1*	5†	1.24 *2*
≤1.1†	0.39 *1*	≤1.3†	1.32 *3*
≤1.8†	0.44 *1*	2.8†	1.46 *1*
3.7†	0.51 *1*	7.8†	1.59 *2*
6.5†	0.60	≤2†	1.79 *3*
22†	0.63	8.4†	1.88 *1*
2†	0.72 *2*	41†	(2.20)
100†	(0.835)	≤2†	2.40 *2*
7†	0.91 *2*	30†	(2.50)*
9†	1.04 *1*	0.6†	2.82 *1*

Continued

Ga^{72} 31 41 14^h

γ's in γ(0.68 ce) delay spectrum

0.03†	0.115 *4*		
0.05†	0.62 *2*	0.20†	1.71 *2*
0.04†	0.73 *3*	0.07†	1.82 *4*
0.16†	0.95 *2*	0.07†	2.15 *4*
0.04†	1.34 *6*	0.08†	2.69 *3*

Table of $\beta\gamma$ given showing additional 1.68γ

(0.84 γ)(0.63, 0.77, 0.89, 1.05, 1.30, 1.62, 1.87, 2.20, 2.50 γ)

(0.63 γ)(0.62, 0.84, 1.05, 1.30, 1.48, 1.64, 1.79, 1.90 γ)

(1.47 γ)(1.05, 1.30, 1.59, 1.90γ)

Decay scheme proposed with levels in Ge^{72}: g.s. (0^+), 0.69 ($\tau = 0.3^{\mu s}$, 0^+), 0.84 (2^+), 1.46 (2^+), 1.73 ($2^+,3^+$), 2.06 (2^+), 2.39 ($1^+,2^+$), 2.51 (2^+), 2.82 ($1^+,2^+$), 3.04 ($2^-,3^-$), 3.32 ($2^-,3^-$), 3.34 (2^-)

No 0.69 photon (≤2†)

*Unresolved 2.508γ and 2.491γ

J.J. Kraushaar, E. Brun, W.E. Meyerhof, Phys. Rev. 101, 139 (1956).

Ge^{72} 32 40

Level — $Ge^{(72)}(\gamma,\gamma)$ — As^{72} recoil

(0.835) $\tau = 3.2^{\mu\mu s}$ *8* — σ

J = 2 — $\gamma,\gamma(\theta)$

F.R. Metzger, Phys. Rev. 101, 286 (1956).

Ge^{74} 32 42

Level — $Ge^{(74)}(\gamma,\gamma)$ — As^{74} recoil

(0.596) $\tau = 13^{\mu\mu s}$ *2* — σ

J = 2 — $\gamma,\gamma(\theta)$

F.R. Metzger, Phys. Rev. 101, 286 (1956).

As^{72} 33 39 26^h

1.5% of disintegrations lead to $0.3^{\mu s}$ level in Ge^{72} at 0.69 — $\beta\gamma,\gamma\gamma$

E. Brun, W.E. Meyerhof, J.J. Kraushaar, Phys. Rev. 100, 1795A (1955); verbal report.

As^{74} 33 41

γ — $As^{75}(\gamma,\gamma')$ — $E_\gamma \leq 19.5$

0.305 *15* $\tau = 12^{ms}$ *3* scin

S.H. Vegors, Jr., P. Axel, Phys. Rev. 100, 1238A (1955); verbal report.

As^{75} 33 42

γ — $As^{75}(n,n'\gamma)$ — E_n = 3.7; scin

0.815 *10*

1.02 *1*

M.A. Rothman, H.S. Hans, C.E. Mandeville, Phys. Rev. 100, 83 (1955).

As^{76} 33 43 26^h

$\gamma(Se^{76})$ 0.5605 *3* cryst

N. Ryde, B. Andersson, Proc. Phys. Soc. 68B, 1117 (1955).

As^{76} 33 43 26[h]

$(0.64\gamma)(0.55\gamma)$ delay = $23^{\mu\mu s}$ *15* scin

C.F.Coleman, Phil. Mag. 46, 1135 (1955).

As^{85} 33 52

Assignment here of 0.43^s delayed-n activity accounts for fission yields in Kr region of U^{233}, U^{235}, U^{238}, Pu^{239}

[$E_\beta > 9$, $B_n(Se^{85}) \sim 5$ from systematics]

W.H.Fleming, quoted by R.K.Wanless, H.G. Thode, Can. J. Phys. 33, 541 (1955).

Se 34

γ Se$(n,n'\gamma)$ $E_n = 3.7$; scin

1.05 *2*

1.50 *3*

M.A.Rothman, H.S.Hans, C.E.Mandeville, Phys. Rev. 100, 83 (1955).

Resonance peaks Se(n) E_n = 1 to 2000 ev chopper

E_o(ev)	$\sigma_o\Gamma^2$
27.1	53
211	1410
270	3520
383	920

L.M.Bollinger, D.A.Dahlberg, R.R.Palmer, G.E.Thomas, Phys. Rev. 100, 126 (1955).

Resonance peaks Se(n) chopper

E_o(ev)	A*	E_o(ev)	A*
212	78	973	78
272		1970	81
383		3110	
673	78	4120	81
884		5340	81

*Product A assignment from enriched samples

J.M.LeBlanc, L.M.Bollinger, R.E.Coté, Phys. Rev. 100, 1248A (1955); verbal report.

Se^{73} 34 39 7.1[h]

Ge$^{(70)}$(28-Mev α,n) chem

β^+ 100† 1.29 *1* sl

≤1†$ 1.65 *2*

$\gamma(As^{73})$

		α_K*	K/LM	
126†	0.0658 *1*	0.22	10.2	M1 scin
154†	0.359 *1*	0.011	8	M2

(sl ce,)

$\gamma^{\pm}(0.066, 0.359\gamma)$ delay = $6.0^{\mu s}$ *2*

$(0.066\gamma)(0.359\gamma)$ $\gamma^{\pm}(0.066\gamma)$ delay < $5^{m\mu s}$

No other γ (< 2†)

$From $6^{\mu s}$ delay for ≥ 99% of $\gamma^{\pm}(0.066\gamma)$

*From ce_K per β^+ and theoretical ϵ/β^+ ratio

R.W.Hayward, D.D.Hoppes, Phys. Rev. 101, 93 (1956); 98, 1172A (1955).

Se^{75} 34 41 127[d]

$(0.097\gamma)(0.280\gamma)$ delay = 18.0^{ms} *15* scin

A.W.Schardt, Bull. Am. Phys. Soc. 1, No. 2, 85, D1 (1955).

Compare As^{74}? on card 56-1-38

Se^{78} 34 44

Resonance peaks Se^{77}(n) chopper

E_o(ev)	E_o(ev)
212	973
673	

J.M.LeBlanc, L.M.Bollinger, R.E.Coté, Phys. Rev. 100, 1248A (1955); verbal report.

Se^{81} 34 47

Resonance peaks Se^{80}(n) chopper

E_o(ev)	E_o(ev)
1970	5340
4120	

J.M.LeBlanc, L.M.Bollinger, R.E.Coté, Phys. Rev. 100, 1248A (1955); verbal report.

Br ? 35

γ Br$(\gamma,?\gamma)$ $E_\gamma \le 22$; scin

0.155 *10** $\gamma\gamma$ delay = $130^{\mu s}$ *20*

0.270 *15* $\gamma\gamma$ delay = $32^{\mu s}$ *10*

*Threshold = 9.85 *25*

S.H.Vegors, Jr., R.B.Duffield, Bull. Am. Phys. Soc. 1, No. 4, 206 R1 (1956); verbal report.

Br^{79} 35 44

Level $Br^{79}(\alpha,\alpha'\gamma)$ $E_\alpha = 3.6$; scin

γ 0.219 $\epsilon B(E2) = 0.025$

No other γ

E.A.Wolicki, L.W.Fagg, E.H.Geer, Phys. Rev. 100, 1265A (1955); verbal report.

Br^{80} 35 45

Resonance peaks Br^{79}(n) chopper

σ_o	E_o(ev)	Γ(ev)	Γ_γ(ev)
3700	35.4	0.44	0.395
1670	54.3	0.375	0.347
1320	188	0.450	0.364
	204*		
	238		
	293*		
	318		
	392*		
	467*		

*May be in Br^{82}

J.M.LeBlanc, L.M.Bollinger, R.E.Coté, Phys. Rev. 100, 1248A (1955); verbal report.

Br^{81} 35 46

Level $Br^{81}(\alpha,\alpha'\gamma)$ $E_\alpha = 3.6$; scin

γ 0.278 $\epsilon B(E2) = 0.031$

E.A.Wolicki, L.W.Fagg, E.H.Geer, Phys. Rev. 100, 1265A (1955); verbal report.

Br^{82} 35 47

Resonance peaks Br^{81}(n) chopper

E_o(ev)	E_o(ev)
101	293*
135	392*
204*	467*

Other peaks at 553, 669, 1540 ev

*May be in Br^{80}

J.M.LeBlanc, L.M.Bollinger, R.E.Coté, Phys. Rev. 100, 1248A (1955); verbal report.

Kr^{80} 36 44

Level $Kr^{(80)}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.6$
γ **0.610** scin

N.P.Heydenburg, G.M.Temmer, Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956); verbal report.

Kr^{82} 36 46

Level $Kr^{(82)}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.6$
γ **0.775** scin

N.P.Heydenburg, G.M.Temmer, Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956); verbal report.

Kr^{83} 36 47

ground state
J 9/2 enriched Kr^{83} S
q +0.22 *2*

E.Rasmussen, V.Middelboe, Kgl. Danske Videnskab. Selskab Mat.-fys. Medd. 30, No. 13 (1955).

Level $Kr^{(83)}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.6$
γ **0.457** scin

N.P.Heydenburg, G.M.Temmer, Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956).

Kr^{84} 36 48

Level $Kr^{(84)}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.6$
γ **0.880** scin

N.P.Heydenburg, G.M.Temmer, Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956); verbal report.

Kr^{85} 36 49 4.4^h

IT 22% $U^{235}(n,f)$
From $10.3^y Kr^{85}/Rb^{85}$ yield ms
Authors conclude U^{235} fission yield is a smooth function of A in this region

A.T.Blades, H.G.Thode, Z. Naturf. 10a, 838 (1955).

s Rb^{85} recoil
Charges 1 to 11 (av. = 1.51) found on recoils

A.H.Snell, F.Pleasonton, Bull. Am. Phys. Soc. 1, No. 1, 42, K6 (1956); verbal report.

$Rb^{\leq 80}$ 37

τ 8^d Ag(480-Mev p) chem

B.V.Kurchatov, V.N.Mekhedov, N.I.Borisova M.Y.Kuznetsova, L.N.Kurchatova, L.V. Christyakov, Conf. Acad. Sci. on Peaceful Use of Atomic Energy, Chem. Sci. p. 178 July (1955); Consultants Bureau Trans. p.111.

Rb^{82} 37 45 1.3^m g.s.

τ 1.1^m *2* Ag(480-Mev p) chem
β^+ 3.5
d 25^dSr chem

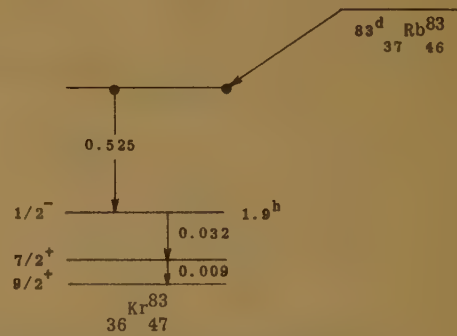
B.V.Kurchatov, V.N.Mekhedov, N.I.Borisova M.Y.Kuznetsova, L.N.Kurchatova, L.V. Christyakov, Conf. Acad. Sci. on Peaceful Use of Atomic Energy, Chem. Sci. p. 178 July (1955); Consultants Bureau Trans. p.111.

Rb^{83} 37 46 83^d

τ 100^d Ag(480-Mev p) chem
d 38^hSr chem

B.V.Kurchatov, V.N.Mekhedov, N.I.Borisova M.Y.Kuznetsova, L.N.Kurchatova, L.V. Christyakov, Conf. Acad. Sci. on Peaceful Use of Atomic Energy, Chem. Sci. p. 178 July (1955); Consultants Bureau Trans. p.111.

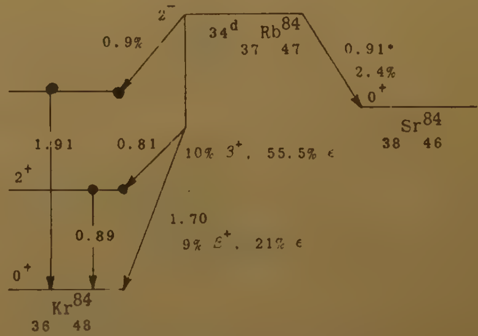
$Br^{(81)}$(14-Mev α,2n) chem
$\gamma(Kr^{83})$ **0.525** *7* scin
(K x ray)(0.525 γ)
ϵ(0.566 level)/ϵ(total) = 1.0 ±0.1 xγ/x
No β with $E_\beta > 0.04$ (< 1%)



M.L.Perlman, J.P.Welker, Phys. Rev. 100, 81 (1955).

Rb^{84} 37 47 34^d g.s.

τ 33.0^d *2* $Br^{(81)}$(14-Mev α,n) chem
β^+ 15† 0.81 *5* scin
  15† 1.70 *7*
β^- 3.7†* 0.910* sl
$\gamma(Kr^{84})$
  100† 0.89 *2* scin
  1.4† 1.91 *5*
No 1.02γ (< 0.5†) (0.89γ)γ
(~0.8β)γ a$\beta\gamma$
(K x ray)(0.89, 1.91γ) $\gamma^\pm$(0.89γ)
(0.81β^+)/(0.89γ) = 0.150 *11* $\gamma^\pm\gamma/\gamma$
ϵ(0.89 level)/ϵ(total) = 0.71 *3* xγ/x



J.P.Welker, M.L.Perlman, Phys. Rev. 100, 74 (1955); *C.S.Wu, N.Benczer, ibid.

Rb^{85} 37 48

Level $Rb^{85}(\alpha,\alpha'\gamma)$ $E_\alpha = 4.4$
γ **0.148** $\epsilon B(E2) = 0.0032$ scin

L.W.Fagg, E.H.Geer, E.A.Wolicki, Bull. Am. Phys. Soc. 1, No. 4, 165 C4 (1956); verbal report.

Rb^{86} 37 49 19^d g.s.

β^- 1 to 5+ 0.230 *20* s
14+ 0.711 *15*
86+ 1.795 *15* $\Delta J = 2$, yes shape
$\gamma(Sr^{86})$ 0.527 *3* s ce
1.081 *4*

A.G.Dmitriev, P.P.Zarubin, Izvest. Akad. Nauk Ser. Fiz. SSSR 18, 580 (1954).

Rb^{87} 37 50 $\sim 5\times 10^{10y}$

τ **5.0×10^{10y}** *2* ms
From Sr^{87}/Rb^{87} in rocks of known ages (Pb/U)
no appreciable Rb, Sr separation found

G.W.Wetherill, L.T.Aldrich, G.R.Tilton, G.L. Davis, Bull. Am. Phys. Soc. 1, No. 1, 31, H6 (1956).

τ **$4.3^{+3}_{-2}\times 10^{10y*}$** specific activity
No γ, no ce 2π pc $\beta\gamma, \beta(ce)$
*Assuming 27.85% Rb^{87} in natural Rb

I.Geese-Bähnisch, Z. Phys. 142, 565 (1955); I.Geese-Bähnisch, E.Huster, Naturwiss. 41, 495 (1954).

Rb^{87} 37 50

Level $Rb^{87}(\alpha,\alpha'\gamma)$ $E_\alpha = 4.4$
γ **0.407** $\epsilon B(E2) = 0.0058$

L.W.Fagg, E.H.Geer, E.A.Wolicki, Bull. Am. Phys. Soc. 1, No. 4, 165 C4 (1956); verbal report.

Sr^{83} 38 45 38^h

τ **34^h** Ag(480-Mev p) chem
p 83^dRb chem

B.V.Kurchatov, V.N.Mekhedov, N.I.Borisova M.Y.Kuznetsova, L.N.Kurchatova, L.V. Christyakov, Conf. Acad. Sci. on Peaceful Use of Atomic Energy, Chem. Sci. p. 178 July (1955); Consultants Bureau Trans. p. 111.

Sr^{87} 38 49 2.8^h

γ **(0.388)** $\alpha = 0.26$ *3* GM
Authors conclude γ is E5

I.V.Estulin, E.M.Moiseeva, Soviet Phys. JETP 1, 463 (1955); Zhur. Eksptl' i Teoret. Fiz. 28, 541 (1955).

Sr^{89} 38 51 51^d

p 14^sY^{89} (0.02%) $0.91\ \gamma/\beta$

W.S.Lyon, R.R.Rickard, Phys. Rev. 100, 112 (1955).

Y^{88} 39 49 105^d g.s.

$\gamma(Sr^{88})$ **0.909** 100% dipole scin
1.850 100% quadrupole
$(0.909\gamma)(1.850\gamma)(\theta)$ J = 3, 2, 0

E.D.Klema, Bull. Am. Phys. Soc. 1, No. 2, 85, D2 (1956).

Y^{89} 39 50

Levels $Y^{89}(n,n')16^sY$ $E_n = 0.9$ to 1.8
(0.91) $\tau = 16.1^s$ *3*
1.2
1.2 level feeds 16^s state; 1.53 level does not

C.P.Swann, F.R.Metzger, Phys. Rev. 100, 1329 (1955).

Zr 40

Levels Zr(n,n') $E_n = 4.3$; scin pulsed n's
g.s.
1.4
2.2
2.8 ?
No 0.90 level

R.V.Smith, Bull. Am. Phys. Soc. 1, No. 1, 55, R6 (1956); verbal report.

γ Zr(n,n'γ) $E_n = 0.35$ to 3.9 scin

E_γ	Thresh
0.552 *5*	1.48 *5*
0.916 *15*	0.92 *2*
1.46 *3*	1.46 *3*

Probably due to Zr^{92}, Zr^{94}

R.B.Day, A.E.Johnsrud, D.A.Lind, Bull. Am. Phys. Soc. 1, No. 1, 56, R9 (1956).

γ Zr(n,n'γ) $E_n = 0.9$ to 2.2
0.930 scin
No other γ observed with $0.6 < E_\gamma < 2$

J.B.Guernsey, C.Goodman, Phys. Rev. 101, 294 (1956).

Zr^{89} 40 49

$Zr^{(90)}(\gamma,n)$
Threshold for 4.3^mZr^{89} (J = 1/2) = 12.37 *9*
Small yield of 79^hZr^{89} (J = 9/2) observed in region $E_\gamma = 12.2$ (expected threshold = 11.78)

J.D.Fox, P.Axel, Phys. Rev. 100, 1249A (1955); verbal report.

Zr^{90} 40 50

γ $Zr^{(90)}(n,n'\gamma)$ $E_n = 0.35$ to 3.9
2.17 *3* Thresh = 2.20 *3* scin
2.30 *3*
3.29 *10*
Also $\gamma^\pm$ with threshold at 1.77 *3* due to pairs from 0^+ level at 1.77

R.B.Day, A.E.Johnsrud, D.A.Lind, Bull. Am. Phys. Soc. 1, No. 1, 56, R9 (1956); verbal report.

Zr^{91} 40 51

ground state

μ -1.9 *2* S

K. Murakawa, Phys. Rev. 100, 1369 (1955).

Level $Zr^{(91)}(n,n'\gamma)$ $E_n = 0.35$ to 3.9

γ 1.22 *3* Thresh = 1.26 *5* scin

R. B. Day, A. E. Johnsrud, D. A. Lind, Bull. Am. Phys. Soc. 1, No. 1, 56, R9 (1956); verbal report.

Zr^{95} 40 55 65^d

β^-	11%	0.250 *30*		s
	53%	0.364 *8*		
	34%	0.404 *8*		
	0.9%	0.90 *3*		
	0.4%	1.13 *4*		
$\gamma(Nb^{95})$		0.723 *2*	M1, E2	s ce
		0.756 *2*	E1	

p $90^h Nb^{95}$ (0.235 γ observed)

P. P. Zarubin, Izvest. Akad. Nauk Ser. Fiz. SSSR 18, 563 (1954).

Zr^{96} 40 56

$\tau_{\beta\beta}$ 93% Zr^{96}; 4π scin

$>5x10^{17y}$ $\beta\beta$

$>3.6x10^{17y}$ β

Search covered $2.5 < E_\beta < 4.25$ and $3.0 < E_\beta < 4.5$

Long τ suggests ν and anti-ν are nonidentical

M. Awschalom, Bull. Am. Phys. Soc. 1, No. 1, 31, H7 (1956); verbal report.

Nb ? 41

γ $Nb^{93}(\gamma,?\gamma)$ $E_\gamma \le 22$; scin

0.088 *5* $\gamma\gamma$ delay = $6.0^{\mu s}$ *15*

S. H. Vegors, Jr., R. B. Duffield, Bull. Am. Phys. Soc. 1, No. 4, 206 R1 (1956).

Nb^{90} 41 49 15^h g.s.

β^+ 1.51 *3* scin

$\gamma(Zr^{90})$			10.4†	1.82	scin
	109†	0.14*	11.5†	1.96	
	8†	0.14*	26†	2.19	
	180†	1.14	150†	2.32 *2*	

($\sim$0.14 γ)($\gamma^\pm$, 1.14, 1.82, 2.19 γ)

(1.51 β)(1.14 γ) No (2.32 γ) γ

*Coincidence measurements imply two 0.14 γ's

N. H. Lazar, G. D. O'Kelley, Bull. Am. Phys. Soc. 1, No. 4, 163 B9 (1956); verbal report.

Nb^{92}? 41 51

γ $Nb^{93}(\gamma,n?\gamma)$ $E_\gamma \le 19.5$

0.085 *5* $\tau = 6.0^{\mu s}$ *5* scin

R. B. Duffield, S. H. Vegors, Jr., quoted by S. H. Vegors, Jr., P. Axel, Phys. Rev. 100, 1238A (1955); verbal report.

Nb^{95} 41 54 35^d g.s.

β^- 0.162 *5* $65^d Zr^{95}$ source; s

$\gamma(Mo^{95})$ 0.764 *2* s ce

P. P. Zarubin, Izvest. Akad. Nauk Ser. Fiz. SSSR 18, 563 (1954).

Mo^{90} 42 48 5.7^h

τ 6.4^h Ag(550-Mev α) chem

p 15^hNb chem

B. V. Kurchatov, V. N. Mekhedov, N. I. Borisova, M. Y. Kuznetsova, L. N. Kurchatova, L. V. Christyakov, Conf. Acad. Sci. on Peaceful Use of Atomic Energy, Chem. Sci. p. 178 July (1955); Consultants Bureau Trans. p. 111.

Mo^{91} 42 49 16^m g.s.

β^+ 3.44 $Mo^{(92)}(\le 22\text{-Mev }\gamma,n)$; s

No (3.44 β) γ scin

N. Gove, F. A. Smith, R. A. Becker, Phys. Rev. 100, 1236A (1955); verbal report.

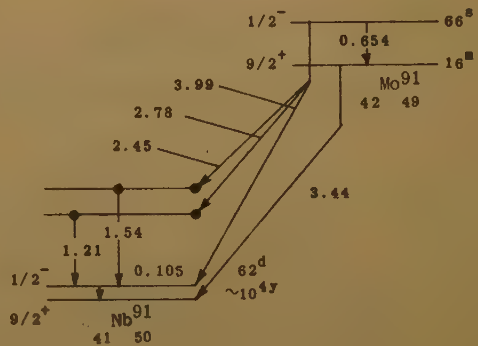
Mo^{91} 42 49 66^s

β^+	51†	2.45	$Mo^{(92)}(\le 22\text{-Mev }\gamma,n)$;	s
	35.8†	2.78		
	13.2†	3.99		
γ	8.9*	0.654 *3*	$\alpha = 0.055$	s ce, scin
$\gamma(Nb^{91})$		1.21		scin
		1.54		

(2.78 β)(1.21 γ) (2.45 β)(1.54 γ)

No β(0.654 γ)

*ce per 100 β^+



N. Gove, F. A. Smith, R. A. Becker, Phys. Rev. 100, 1236A (1955); verbal report.

Mo^{95} 42 53

ground state

J 5/2 para

J. Owen, I. M. Ward, Phys. Rev. 102, 591 (1956).

ground state

J 7/2 S

K. Murakawa, Phys. Rev. 100, 1369 (1955).

Mo^{97} 42 55

	ground state	
J	5/2	para

J.Owen, I.M.Ward, Phys. Rev. 102, 591 (1956).

	ground state	
J	7/2	S

K.Murakawa, Phys. Rev. 100, 1369 (1955).

Mo^{99} ? γ 42 57

$Mo^{(100)}(\gamma, n?\gamma)$ $E_\gamma \leq 19.5$
0.098 *5* $\tau = 16.5^{\mu s}$ *12* scin
Threshold = 8.4 ± 0.6

S.H.Vegors, Jr., P.Axel, Phys. Rev. 100, 1238A (1955); verbal report.

Mo^{105} 42 63 ~5^m

$<2^m$ U(fast n,f) chem

J.Flegenheimer, G.B.Baró, A.Medina, Z. Naturf. 10a, 798 (1955).

Tc^{105} 43 62 10^m

τ 10^m *1* U(fast n, f) chem
p $4.4^h Ru^{105}$

J.Flegenheimer, G.B.Baro , A.Medina, Z. Naturf. 10a, 798 (1955).

Ru^{95} 44 51 1.6^h

τ 1.7^h *1* Ag(480-Mev p) chem

B.V.Kurchatov, V.N.Mekhedov, N.I.Borisova M.Y.Kuznetsova, L.N.Kurchatova, L.V. Christyakov, Conf. Acad. Sci. on Peaceful Use of Atomic Energy, Chem. Sci. p. 178 July (1955); Consultants Bureau Trans.p. 111.

Ru^{99} 44 55

	ground state	
J	5/2	natural Ru; S
μ	-0.63* *15*	

*Calculated from $\bar{\mu}$ (for A = 99, 101) = -0.66 *2*,
using μ_{101}/μ_{99} = 1.09 *3*§

K.Murakawa, J. Phys. Soc. Japan 10, 919 (1955); 9, 427, 651 (1954). §J.H.E.Griffiths, J.Owen, Proc. Phys. Soc. 65A, 951 (1952).

Ru^{101} 44 57

	ground state	
J	5/2	natural Ru; S
μ	-0.69* *15*	

*Calculated from $\bar{\mu}$(for A = 99, 101) = -0.66 *2*,
using μ_{101}/μ_{99} = 1.09 *3*§

K.Murakawa, J. Phys. Soc. Japan 10, 919 (1955); 9, 427, 651 (1954). §J.H.E.Griffiths, J.Owen, Proc. Phys. Soc. 65A, 951 (1952).

Rh^{103} 45 58

Level $Rh^{103}(p,p'\gamma)$
γ 0.305 E2/M1 = 0.032 p,γ(L)
B(E2) = 0.208

P.H.Stelson, F.K.McGowan, Bull. Am. Phys. Soc. 1, No. 4, 164 C2 (1956); verbal report.

Rh^{106} 45 61 30^s g.s.

$\gamma(Pd^{106})$ $1.0^y Ru^{106}$ source

100†	0.513			scin pr.
53†	0.624	1.0†	1.77 *4*	scin
3†	0.87	0.6†	1.96 *5*	
8†	1.045	0.5†	2.10 *5*	
≤0.8†	1.14 ?	1.0†	2.37 *6*	
2.5†	1.55 *4*	0.2†	2.66 *7*	

No 0.41γ (< 2†) scin γγ, scin
No 0.22, 0.72, 0.805, ~1.21, 1.39, 1.85 γ
(0.513γ)(0.62, 1.04γ; others with E_γ < 2.0)
(1.04γ)(0.87γ)
Decay scheme proposed

D.E.Alburger, B.J.Toppel, Phys. Rev. 100, 1357 (1955).

Pd ? 46

γ Pd(γ, ?γ) $E_\gamma \leq 19.5$
0.165 *16* } $\tau = 33^{\mu s}$ *6* scin
0.305 *15*

S.H.Vegors, Jr., P.Axel, Phys. Rev. 100, 1238A (1955); verbal report.

Pd^{100} 46 54 4.0^d

τ 4.1^d *2* Ag(480-Mev p) chem

B.V.Kurchatov, V.N.Mekhedov, N.I.Borisova M.Y.Kuznetsova, L.N.Kurchatova, L.V. Christyakov, Conf. Acad. Sci. on Peaceful Use of Atomic Energy, Chem. Sci. p. 178 July (1955); Consultants Bureau Trans.p. 111.

Ag 47

Levels Ag(p,p'γ)
γ ~0.315 E2/M1 = 0.032 p,γ(L)
B(E2) = 0.226

P.H.Stelson, F.K.McGowan, Bull. Am. Phys. Soc. 1, No. 4, 164 C2 (1956); verbal report.

Resonances Ag(n,γ) pulsed n's; scin γ

E_o(ev)	Γ(ev)	$\sigma_o\Gamma$	$g\Gamma_n^o$(mev)
16.3	0.12	250	0.39
30.5	0.12	250	0.7
40.5	~0.05	249	0.6
41.6	~0.5	240	0.6
45.0	0.16	24	0.06
51.6	0.13	470	1.3
55.9		E_o(ev)	E_o(ev)
71.2		139.6	203
88.0		143.7	209
133.4		173	250

W.W.Havens,Jr., G.Grim, J.S.Desjardins, J. Rosen, J.Rainwater, Bull. Am. Phys. Soc. 1, No. 4, 177 F15 (1956); verbal report.

Ag^{103} 47 56 59^m

τ 59^m *6* $Ag^{(107)}$(50-Mev p,5nβ)chem

P.A.Johnson, Can. J. Phys. 33, 841 (1955).

Ag^{104} 47 57, 27^m

τ	27^m *1*		d 59^mCd chem
β^+	2.70 *1*		59^mCd source; sl
$\gamma(Pd^{104})$			
2*	0.1184		sπ ce
7*	0.5562	K/L~7	

*Relative ce_K intensities

F.A.Johnson, Can. J. Phys. 33, 841 (1955); Proc. Roy. Soc. Canada 46, 135A (1952).

Ag^{105} 47 58, 45^d

$\gamma(Pd^{105})$ — Rh^{103}(25 - Mev α, 2n) chem; Pd(13 - Mev d) chem

			K/LM		
20†	0.0640	*5*	>5	M1	scin, sl ce
w	0.157	*1*			scin
•	0.184$	*1*	3.0		sl ce
60†	0.2810	*5*	8.2	M1	scin, sl ce
w	0.319	*2*			scin $\gamma\gamma$
w	0.331	*2*			scin $\gamma\gamma$
100†	0.345	*1*	5.8	E2	scin, sl ce
w	0.393	*3*			scin
~30†	0.443	*1*	7.0		scin, sl ce
~8†	0.654	*5*			scin

(K x ray)(0.064, 0.281, 0.345, 0.443, 0.654γ)
(0.064γ)(0.281γ) (0.319γ)(0.331γ)
(0.443γ)(0.654γ)
•ce only $Could be $\gamma(Ag^{105})$ or $\gamma(Pd^{105})$

R.W.Hayward, D.D.Hoppes, Bull. Am. Phys. Soc. 1, No. 1, 42, K4 (1956); verbal report.

$\gamma(Pd^{105})$ — Pd(22-Mev d) chem

>20*	0.065	K/L>0.1	scin, sl ce
7.5*	0.117	=1.7	sl ce
42*	0.158		
68*	0.185	=4.2	
475*	0.287	=5.5	scin, sl ce
39*	0.328		sl ce
52*	0.351	=0.6	
36*	0.395		
93*	0.446	=7.2	scin, sl ce

*Relative ce_K intensities
All γ's have $\tau >> 9^d$ so they are not due to Ag^{106}; the 0.117 γ may be due to Ag^{110}

D.E. Alburger, B.J.Toppel, Phys. Rev. 100, 1357 (1955).

Ag^{106} 47 59, 8.6^d

$\gamma(Pd^{106})$ — Pd(22-Mev d) chem

	0.22	180*	K/L = 3.2	scin,
	0.408	135*		sl ce
100†	0.513	567*	K/L = 7.7	
20†	0.624	95*		
20†	0.72	78*		
	0.805	45*		
31†	1.045	37*		sl ce, pe,
10†	1.131	13*		scin
~10† [	1.205	12*		
	1.225	7*		
10†	1.388	1.8*		sl ce,
33†	1.53	10*		scin pr

Continued

Ag^{106} 47 59, 8.6^d

$\gamma(Pd^{106})$

6†	1.72	scin pr
5†	1.85	
1†	2.10	
0.3†	2.63	

Other γ's with $2.0 < E_\gamma < 2.5$ scin pr
No 0.87, 1.96, 2.41 γ
*Relative ce_K intensities
Decay scheme proposed

D.E. Alburger, B.J.Toppel, Phys. Rev. 100, 1357 (1955).

Ag^{107} 47 60

Levels	$Ag^{107}(p, p'\gamma)$		E_p = 3.0
	$Ag^{107}(\alpha, \alpha'\gamma)$		E_α = 4.0
γ	0.319 *3*	B(E2) = 0.16	scin
	0.419 *4*	= 0.23	

L.W.Fagg, E.A.Wolicki, R.O.Bondelid, K.L. Dunning, S.Snyder, Phys. Rev. 100, 1299; 98, 1538A (1955).

Ag^{109} 47 62

Levels	$Ag^{109}(p, p'\gamma)$		E_p = 3.0
	$Ag^{109}(\alpha, \alpha'\gamma)$		E_α = 4.0
γ	0.306 *3*	B(E2) = 0.18	scin
	0.412 *4*	= 0.31	

L.W.Fagg, E.A.Wolicki, R.O.Bondelid, K.L. Dunning, S.Snyder, Phys. Rev. 100, 1299; 98, 1538A (1955).

Ag^{110} 47 63, 24^s, g.s.

β^-	100%	2.869 *20*	sπ

No other β (<5%), no γ, no $\beta\gamma$ — sπ, scin

R.F.Thomas, Jr., W.A.Whitaker, C.L.Peacock, Bull. Am. Phys. Soc. 1, No. 2, 86, D3 (1956); verbal report.

Ag^{110} 47 63, 270^d

β^-	55%	0.086 *5*			sπ
	43%	0.536 *5*	No other β(<0.1%)		
$\gamma(Ag^{110})$~2%		0.116 *2*	K/LM = 1.07		sπ ce
$\gamma(Cd^{110})$		0.447 *5*			sπ pe, ce;
		0.575 *5*	~7†	0.820 *8*	scin
		0.620 *6*	100†	0.883 *9*	
	100†	0.656* *6*	55†	0.945 *9*	
		0.685 *7*	30†	1.382 *13*	
		0.705 *7*		1.492 *15*	
		0.759 *7*		1.519 *15*	

*K/LM = 11 (0.656γ)(all strong γ's)

R.F.Thomas, Jr., W.A.Whitaker, C.L.Peacock, Bull. Am. Phys. Soc. 1, No. 2, 86, D3 (1956).

Ag^{115} 47 68, 21^m

p 2.3^dCd (92.3%)	U(~150-Mev p) chem
p 43^dCd (7.7%)	U(~200-Mev d) chem

H.G.Hicks, R.S.Gilbert, Phys. Rev. 100, 1286 (1955).

$_{48}$Cd ? Unassigned ce Ag(50-Mev p) chem

		sπ ce
0.06065		
0.12345	0.5597	0.6312
0.12461	0.5949	0.6599
0.15437	0.6005	0.6645
0.15832	0.6009	0.6691
0.2285	0.6048	0.6846
0.5338	0.6267	0.7337
0.5550	0.6291	0.7436

Assignable to Cd or daughter activities

F.A.Johnson, Can. J. Phys. 33, 841 (1955).

$_{48}$Cd Levels Cd(n,n′) $E_n = 2.45$

39†	0.64	pulsed n's
30†	1.36	
30†	1.49	

†σ(90°) in mb/sterad

L.Cranberg, J.S.Levin, Bull. Am. Phys. Soc. 1, No. 1, 56, R10 (1956); verbal report.

γ Cd(n,n′γ) $E_n = 3.2$

0.57 scin
2.8

I.L.Morgan, Bull. Am. Phys. Soc. 1, No. 2, 96, N11 (1956).

$Cd^{104}_{48\ 56}$ 59^m τ 59^m 2 $Ag^{(107)}$(50-Mev p,4n) chem

No β^+ sl

$\gamma(Ag^{104})$

40*	0.0667	$K/L_1 = 10$	M1	sπ ce
500*	0.0836	$K/L_1 = 8$	M1	
		$L_1:L_2:L_3 = 60:2:1$		
2*	0.1236			
2*	0.1342			

*Relative ce_K intensities

F.A.Johnson, Can. J.Phys. 33, 841 (1955); Proc. Roy. Soc. Canada 46, 135A (1952).

τ 54^m 1 Ag(480-Mev p) chem

B.V.Kurchatov, V.N.Mekhedov, N.I.Borisova M.Y.Kuznetsova, L.N.Kurchatova, L.V. Christyakov, Conf. Acad. Sci. on Peaceful Use of Atomic Energy, Chem. Sci. p. 178 July (1955); Consultants Bureau Trans. p. 111.

$Cd^{111}_{48\ 63}$ Level Cd^{111}(p,p′γ)

γ 0.342 E2/M1 = 0.152 p,γ(L)
B(E2) = 0.100

P.H.Stelson, F.K.McGowan, Bull. Am. Phys. Soc. 1, No. 4, 164 C2 (1956); verbal report.

$Cd^{111}_{48\ 63}$ Levels Cd^{111}(p,p′γ) $E_p = 3.0$ scin

0.342 level

γ	13%	0.092	
	13%	0.250	
	87%	0.342	B(E2) = 0.10

(0.092 γ)(0.250 γ)

0.610 level

γ	2% {	0.270		0.092
		0.360		0.250
	98%	0.610	B(E2) = 0.12	0.342

(0.270 γ)(0.342 γ) (0.360 γ)(0.250 γ)

F.K.McGowan, P.H.Stelson, M.M.Bretscher, Bull. Am. Phys. Soc. 1, No. 4, 164 C1 (1956); verbal report.

$Cd^{113}_{48\ 65}$ 5.1^y Cd^{112}(pile n,γ)

γ ~0.1† 0.265 E5 scin γ/β

Most K x rays observed ascribed to Cd^{109} scin

†Photons per 100 β

E. der Mateosian, M.Goldhaber, Bull. Am. Phys. Soc. 1, No. 4, 207 R6 (1956).

$Cd^{113}_{48\ 65}$ Level Cd^{113}(p,p′γ)

γ 0.300 E2/M1 = 0.084 p,γ(L)
B(E2) = 0.100

P.H.Stelson, F.K.McGowan, Bull. Am. Phys. Soc. 1, No. 4, 164 C2 (1956); verbal report.

Levels Cd^{113}(p,p′γ) $E_p = 3.3$ scin

0.582 level

γ	16%	0.282	
	16%	0.300	
	84%	0.582	B(E2) = 0.276

(0.282 γ)(0.300 γ)

0.675 level

γ	2%	0.300
	2%	0.375
	98%	0.675

(0.375 γ)(0.300 γ)

F.K.McGowan, P.H.Stelson, M.M.Bretscher, Bull. Am. Phys. Soc. 1, No. 4, 164 C1 (1956); verbal report.

$Cd^{114}_{48\ 66}$ Capture γ's $Cd^{(113)}$(th n,γ) sπ Cp

42†	0.56 1	2.5†	2.78 2
14†	0.66 1		2.91 3
7.5†	0.73 1		3.00 3
2†	~0.76 2		~3.41 4
7†	0.82 1		**
4†	1.23 1.5	1†	5.07 7
4†	1.31 2	2†	5.33 7
5†	1.37 2	1†	5.50 6
3†	1.42 2	1.8†	5.72 10
3†	1.52 2	3.5†	5.97 7
3†	1.63 2	1.3†	6.06 10
2†	1.79 2		6.75 5
	1.82 2	0.8†	6.91 5

Continued

$^{114}_{48}Cd_{66}$

	1.87 *2*	0.2†	7.12 *5*
	2.15 *3*	0.1†	~7.46 *5*
	2.28 *3*	0.6†	7.71 *5*
5†	2.45 *2*	0.5†	7.86 *5*
4†	2.56 *2*	0.4†	8.48 *3*
4†	2.68 *2*	0.2†	9.04 *3*

Levels proposed at 0.55, 1.20, 1.28, 1.38, 1.85, 2.15, 2.28, 3.00, 3.08, 3.33, 3.55, 3.72, 3.98

**Lines not resolved

†Photons/100 Cd captures

B.P. Adyasevich, B.D. Groshev, A.M. Demidov, Conf. Acad. Sci. USSR on Peaceful Use of Atomic Energy, Phys. Math. Sci. p. 270 July (1955); Consultants Bureau Trans. p. 195.

$^{116}_{48}Cd_{68}$ $\tau_{\beta\beta}$ $>3 \times 10^{16y}$ 81% Cd^{116}; Σ scin

From absence of counts from 2 to 3.5 Mev

J.F. Detoeuf, R. Moch, J. phys. radium 16, 897 (1955); Compt. rend. 241, 393 (1955).

$_{49}In$ γ In(n,n′γ) E_n = 0.35 to 3.9

0.26		scin
0.50	1.11	
0.91	1.42	

R.B. Day, A.E. Johnsrud, D.A. Lind, Bull. Am. Phys. Soc. 1, No. 1, 56, R9 (1956).

$^{107}_{49}In_{58}$ 33^m

τ	$\sim 30^m$	Cd^{106}(7.8-Mev d,n)	chem
β^+	~2		scin
$\gamma(Cd^{107})$	0.22		scin $\beta\gamma$, scin
$\beta(0.22\gamma)$			

W.A. Cassatt, Jr., W.W. Meinke, Phys. Rev. 100, 1372 (1955).

$^{111}_{49}In_{62}$ 2.8^d $(0.172\gamma)(0.247\gamma)$ delay = $85^{m\mu s}$ 2

L.H. Rietjens, H.J. Van den Bold, A. Heyligers, Physica 21, 899 (1955).

$(0.172\gamma)(0.247\gamma)$ delay = $84.9^{m\mu s}$ $^{+13}_{-5}$ scin

P.C. Simms, R.M. Steffen, Bull. Am. Phys. Soc. 1, No. 4, 207 R5 (1956).

$^{113}_{49}In_{64}$ 1.7^h γ (0.392) α = 0.39 *4* GM

Authors conclude γ is E5

I.V. Estulin, E.M. Moiseeva, Soviet Phys. JETP 1, 463 (1955); Zhur. Eksptl' i Teoret. Fiz. 28, 541 (1955).

$^{114}_{49}In_{65}$? γ $In^{(115)}(\gamma,n\gamma)$ $E_\gamma \leq 22$; scin

0.312 *15* $\gamma\gamma$ delay = 42^{ms} *5*

Threshold = 9.93 *10*

S.H. Vegors, Jr., R.B. Duffield, Bull. Am. Phys. Soc. 1, No. 4, 206 R1 (1956); verbal report.

$^{114}_{49}In_{65}$ 72^s g.s. Cd^{114}(20-Mev p,n); Cd^{114}(20-Mev d,2n)

β^-	0.1%	0.675 *25*	a $\beta\gamma$
	97%	2.0	a
β^+	(0.004%)	(1.3)	
$\gamma(Cd^{114})$		0.556	scin
$\gamma(Sn^{114})$		1.30	

No 0.572 γ, 0.722 γ ($\leq$0.2%) No 1.278 γ

$(0.675\beta)(1.30\gamma)$ (K x ray)(0.556γ)

No (K x ray)$(0.722, 1.30\gamma)$

(K x ray)/β in 72^s and in 50^d In shows 1.7% ϵ_K goes to Cd^{114} g.s.

L. Grodzins, H. Motz, Phys. Rev. 100, 1236A (1955); verbal report.

$^{114}_{49}In_{65}$ 50^d

<u>0.192 level</u>

J	5	M
μ	+4.7 5*	

L.S. Goodman, S. Wexler, Phys. Rev. 100, 1245A (1955); *verbal report.

γ	(0.192)	In^{113}(pile n,γ); scin
$\gamma(Cd^{114})$	0.556	
	0.722	

No 0.572 γ, 1.278 γ

$(0.556\gamma)(0.722\gamma)$

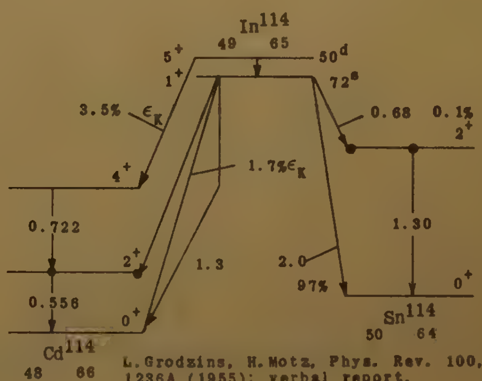
No $(0.556\gamma)(1.30\gamma)$; 1.30 γ assigned to 72^sIn

L. Grodzins, H. Motz, Phys. Rev. 100, 1236A (1955); verbal report.

$(0.722\gamma)(0.556\gamma)(\theta)$ J = 4, 2, 0

Influence of physical and chemical state of source on $\gamma\gamma(\theta)$ not found

R.M. Steffen, L.M. Noble, Bull. Am. Phys. Soc. 1, No. 1, 42, K5 (1956).



L. Grodzins, H. Motz, Phys. Rev. 100, 1236A (1955); verbal report.

In^{115} 49 66 — ground state

$|\mu_3|$ 0.31 *1*

Calculated using data of P. Kusch, T.G. Eck*

C. Schwartz, Phys. Rev. 97, 380 (1955); *P. Kusch, T.G. Eck, Phys. Rev. 94, 1799 (1954).

In^{115} 49 66 4.5^h

γ (0.335) $\alpha = 0.90$ *6* GM

Authors conclude γ is E5

I.V. Estulin, E.M. Moiseeva, Soviet Phys. JETP 1, 463 (1955); Zhur. Eksptl' i Teoret. Fiz. 28, 541 (1955).

In^{115} 49 66

Levels $In^{(115)}(\gamma,\gamma')4.5^h$ In^{115}

2† 1.02 $E_\gamma = 1.1$ to 2

10† 1.45

†$\int\sigma dE$ in units of 10^{-33} Mev-cm^2

J.L. Burkhardt, E.J. Winhold, T.H. Dupree, Phys. Rev. 100, 199 (1955).

Level $In^{(115)}(\alpha,\alpha'\gamma)$ $E_\alpha = 7$ to 20

1.5 scin 0.335 γ

R.R. McLeod Phys. Rev. 100, 1265A (1955).

γ $In^{(115)}(p,p'\gamma)$ $E_p \sim 3.0$; scin

0.512 *12*

Yield as $f(E_p)$ incompatible with E2 excitation

A.S. Divatia, R.H. Davis, R.D. Moffat, D.A. Lind, Phys. Rev. 100, 1266A (1955); verbal report.

In^{116} 49 67 — 54^m isomeric level

J 5 M

μ +4.4 *4**

L.S. Goodman, S. Wexler, Phys. Rev. 100, 1796A (1955); *verbal report.

Sn ? 50

γ $Sn(\gamma, ?\,\gamma)$ $E_\gamma \le 22$; scin

0.503 *15* $\gamma\gamma$ delay = $165^{\mu s}$ *15*

S.H. Vegors, Jr., R.B. Duffield, Bull. Am. Phys. Soc. 1, No. 4, 206 R1 (1956); verbal report.

Sn^{110} 50 60 4.1^h

τ 4.1^{h*} *2* Cd^{108}(32-Mev α,2n) chem

$\gamma(In^{110})$ 0.285 scin, sl ce

p $66^m In^{110}$

S.W. Mead, M.D. Petroff, W.O. Doggett, Phys. Rev. 100, 1794A (1955); *verbal report.

Sn^{113} 50 63 118^d

E_ϵ 0.10 *1* (K x ray)(continuum γ)

R.G. Jung, M.L. Pool, Bull. Am. Phys. Soc. 1, No. 4, 172 E11 (1956).

Sn^{115} 50 65

$Sn^{115}(\alpha,\alpha'\gamma)$ $E_\alpha = 4.5$

No γ observed scin

L.W. Fagg, E.H. Geer, E.A. Wolicki, Bull. Am. Phys. Soc. 1, No. 4, 165 C4 (1956); verbal report.

Sn^{117} 50 67

$Sn^{117}(\alpha,\alpha'\gamma)$ $E_\alpha = 4.5$

No γ observed scin

L.W. Fagg, E.H. Geer, E.A. Wolicki, Bull. Am. Phys. Soc. 1, No. 4, 165 C4 (1956); verbal report.

Sn^{119} 50 69

$Sn^{119}(\alpha,\alpha'\gamma)$ $E_\alpha = 4.5$

No γ observed scin

L.W. Fagg, E.H. Geer, E.A. Wolicki, Bull. Am. Phys. Soc. 1, No. 4, 165 C4 (1956); verbal report.

Sn^{130} ? 50 80 2.6^m

τ 2.6^m *3* U(n,f) chem

From milking of 10^mSb

A.C. Pappas, D.R. Wiles, J. Inorg. Nuclear Chem. 2, 69 (1956).

Sn^{131} 50 81 3.4^m

τ 3.4^m *5* U(n,f) chem

From milking of 23^mSb

A.C. Pappas, D.R. Wiles, J. Inorg. Nuclear Chem. 2, 69 (1956).

Sn^{132} 50 82 2.2^m

τ 2.2^m *3* U(n,f) chem

From milking of 2.1^mSb

A.C. Pappas, D.R. Wiles, J. Inorg. Nuclear Chem. 2, 69 (1956).

Sb 51

γ $Sb(n,n'\gamma)$ $E_n = 3.7$; scin

1.00 *4* $\sigma(90°) = 75$ mb/sterad

M.A. Rothman, H.S. Hans, C.E. Mandeville, Phys. Rev. 100, 83 (1955).

Sb^{119} 51 68 39^h

τ 38.0^h d $4.5^d Te^{119}$ chem

E_ϵ 0.563 *10* scin γ continuum

$\gamma(Sn^{119})$ 0.02383**3* $\alpha = 6.3$ *4* $s\pi$ ce

$L_1/L_2L_3 > 3$* M1

(K x ray)(0.024 γ) delay = $18.5^{m\mu s}$

J.L. Olsen, L.G. Mann, M. Lindner, Bull. Am. Phys. Soc. 1, No. 1, 41, K2 (1956); *J.M. Hollander, ibid.

Sb^{122} 51 71, 2.75^d g.s.

$\gamma(Te^{122})$ 0.56393 *19* cryst

N.Ryde, B.Andersson, Proc. Phys. Soc. 68B, 1117 (1955).

$\beta(0.57\gamma)$ delay = $150^{\mu\mu s}$ *20* scin

C.F.Coleman, Phil. Mag. 46, 1135 (1955).

Sb^{130}? 51 79, 10^m

τ 9.2^m *3* d 2.6^{m}Sn chem

A.C.Pappas, D.R.Wiles, J. Inorg. Nuclear Chem. 2, 69 (1956).

Sb^{132} 51 81, 2.1^m

τ 2.1^m *2* d 2.2^{m}Sn chem

A.C.Pappas, D.R.Wiles, J. Inorg. Nuclear Chem. 2, 69 (1956).

Te^{120} 52 68

Level $Te^{120}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.5$

γ 0.560 $\tau = 9.4^{\mu\mu s}$ scin

N.P.Heydenburg, G.M.Temmer, Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956); verbal report.

Te^{121} 52 69, 154^d

γ $Sb^{(121)}$(15-Mev d,2n) chem

0.0818 sl ce

0.214 E2/M1 = 0.059 scin, sl ce

(ce_K 0.082 γ)(0.214 γ)(θ) sl ce,
(ce_L 0.082 γ)(0.214 γ)(θ) scin
(ce_K 0.082 γ)(ce_K 0.214 γ)(θ)

Results compatible with J = 11/2, 3/2, 1/2

N.Goldberg, S.Frankel, Phys. Rev. 100, 1350 (1955); 93, 1425 (1954).

γ (0.214) $\alpha_k = 0.072$ *3* sl ce

K/L = 6.3 *3*

N.Goldberg, Bull. Am. Phys. Soc. 1, No. 4, 207 R7 (1956).

Te^{122} 52 70

Level $Te^{122}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.5$

γ 0.570 $\tau = 10^{\mu\mu s}$ scin

N.P.Heydenburg, G.M.Temmer, Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956); verbal report.

Te^{123} 52 71, 104^d

γ $Sb^{(123)}$(15-Mev d,2n) chem

0.0887 sl ce

0.159 E2/M1 = 0.013 scin, sl ce

(ce_K 0.089 γ)(0.159 γ)(θ) sl ce,
(ce_L 0.089 γ)(0.159 γ)(θ) scin
(ce_K 0.089 γ)(ce_K 0.159 γ)(θ)
Results compatible with J = 11/2, 3/2, 1/2

N.Goldberg, S.Frankel, Phys. Rev. 100, 1350 (1955); 93, 1425 (1954).

γ (0.159) $\alpha_K = 0.165$ *5* sl ce

K/L = 6.6 *3*

N.Goldberg, Bull. Am. Phys. Soc. 1, No. 4, 207 R7 (1956).

Te^{123} 52 71

Levels $Te^{123}(p,p'\gamma)$ $E_p = 3.7$; scin
$Te^{123}(\alpha,\alpha'\gamma)$ $E_\alpha = 4.0$; scin

0.159 level

γ 0.159 *2* B(E2) = 0.018 (α = 0.21)

0.436 level		0.504 level	
γ	0.159 *2*	γ	0.159 *2*
	0.274 *3*		0.342 *3*
	0.436 *5*		0.504 *5*

(0.274 γ)(0.159 γ) (0.342 γ)(0.159 γ)
No (0.274 γ)(0.342 γ) No 0.068 γ

L.W.Fagg, E.A.Wolicki, R.O.Bondelid, K.L. Dunning, S.Snyder, Phys. Rev. 100, 1299; 98, 1538A (1955).

Te^{124} 52 72

Level $Te^{124}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.5$

γ 0.608 $\tau = 8.8^{\mu\mu s}$ scin

N.P.Heydenburg, G.M.Temmer, Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956); verbal report.

Capture γ $Te^{(123)}(n,\gamma)$ $E_n = 2.33$ ev

~50† (0.600) scin
†Photons/100 Te^{123} captures

R.G.Bennett, A.E.Walters, C.A.Fenstermacher, L.Rosler, Bull. Am. Phys. Soc. 1, No. 1, 62, UA5 (1956).

Te^{125} 52 73

γ $Te^{125}(p,p'\gamma)$ $E_p = 3.0$
0.435 B(E2) = 0.44* scin
0.633 = 0.26$

Assuming γ cascade from level at *0.47, $0.67

L.W.Fagg, E.A.Wolicki, R.O.Bondelid, K.L. Dunning, S.Snyder, Phys. Rev. 100, 1299; 98, 1538A (1955).

Te^{126} 52 74

Level $Te^{126}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.5$
γ **0.662** $\tau = 7.0^{\mu\mu s}$ scin

N.P. Heydenburg, G.M. Temmer, Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956); verbal report.

$Te^{126}(n,n'\gamma)$ $E_n = 4.4$ scin
0.6† **0.68** *2*
~0.2† **1.38** *4*
No 0.74 γ (< 0.03†)
†Relative to 0.83 γ from same reaction on Te^{130}

R.M. Sinclair, Bull. Am. Phys. Soc. 1, No. 1, 42 K3 (1956); verbal report.

Te^{127} 52 75 9.3^h g.s.

$Te^{(128)}(\gamma,n)$ chem
β^- **0.683** *10* scin
No γ

M.C. Day, Jr., G.W. Eakins, A.F. Voigt, Phys. Rev. 100, 796 (1955).

Te^{128} 52 76

Level $Te^{128}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.5$
γ **0.750** $\tau = 4.2^{\mu\mu s}$ scin

N.P. Heydenburg, G.M. Temmer, Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956); verbal report.

Level $Te^{128}(n,n'\gamma)$ $E_n = 4.4$
γ 0.7† **0.76** 2 scin
†Relative to 0.83 γ from same reaction on Te^{130}

R.M. Sinclair, Bull. Am. Phys. Soc. 1, No. 1, 42, K3 (1956); verbal report.

Te^{129} 52 77 72^m g.s.

τ 74^m
β^- 10% 0.29 15% 0.989 sl
4% 0.69 71% 1.453
$\gamma(I^{129})$ 0.027 scin; sl ce, pe
0.212 0.725
0.475 1.12

W.E. Graves, A.C.G. Mitchell, Phys. Rev. 100, 1236A (1955).

$Te^{(130)}(\gamma,n)$ chem
β^- ~20% **1.01** *2* scin $\beta\gamma$
~80% **1.46** *1* scin
$\gamma(I^{129})$ ~**0.035**
0.450 *5*
(1.46 β)(~0.035 γ) (1.01 β)(0.45 γ)
(~0.035 γ)(0.45 γ) No 0.485 γ

M.C. Day, Jr., G.W. Eakins, A.F. Voigt, Phys. Rev. 100, 796 (1955).

Te^{129} 52 77 72^m g.s.

$\gamma(I^{129})$ 10† **0.460** *10* scin
w **0.775*** *20*
1† **1.070** *20*
No γ with $0.15 < E_\gamma < 0.45$
*Assignment uncertain

T. Stribel, Z. Naturf. 10a, 797 (1955).

Te^{129} 52 77 33^d

τ 41^d
γ **0.1063** *1* K/L~1, α large

W.E. Graves, A.C.G. Mitchell, Phys. Rev. 100, 1236A (1955).

Te^{130} 52 78

Level $Te^{130}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.5$
γ **0.850** $\tau = 2.4^{\mu\mu s}$ scin

N.P. Heydenburg, G.M. Temmer, Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956); verbal report.

Level $Te^{130}(n,n'\gamma)$ $E_n = 4.4$
γ **0.83** 2 scin

R.M. Sinclair, Bull. Am. Phys. Soc. 1, No. 1, 42, K3 (1956); verbal report.

I^{127} 53 74

ground state
$|\mu_3|$ 0.17 *3*
Recalculated using data of V. Jaccarino et al.*

C. Schwartz, Phys. Rev. 97, 380 (1955); *V. Jaccarino et al., Phys. Rev. 94, 1798 (1954).

γ $I^{127}(\alpha,\alpha'\gamma)$ scin
0.060 *2*
0.201 *4*

γ $I^{127}(p,p'\gamma)$ $E_p = 3.2$ scin
0.208 *7* B(E2) = 0.044 (α = 0.14)
0.392* *8*
0.438 *10* B(E2) = 0.0061
0.631 *10* = 0.116
0.751 *25* = 0.074
0.94* *5*
*Yield as f(E_p) incompatible with E2 excitation

A.S. Divatia, R.H. Davis, R.D. Moffat, D.A. Lind, Phys. Rev. 100, 1266A (1955); verbal report.

I^{128} 53 75 25^m

β^- ~**1.6** scin $\beta\gamma$
~**2.0** scin
$\gamma(Xe^{128})$ **0.428**
(~1.6 β)(0.428 γ)

T. Stribel, Z. Naturf. 10a, 797 (1955).

$I^{128}_{53\ 75}$ 25^m

$\gamma(Xe^{128})$* $I^{127}(n,\gamma)$ chem; scin

100†	0.440 *5*
<1.5†	0.520
3†	0.960 *15*

$\gamma(Te^{128})$*

~0.5†	0.750

*Assignment from energy systematics of 2^+ states

R.K. Gupta, S.Jha, Nuclear Phys. 1, 2 (1956).

$I^{128}_{53\ 75}$

Capture γ's I^{127}(th n,γ) scin Cp

st	~0.085
w	0.255

Study covered E_γ = 0.1 to 2.5

M.Reier, M.H.Shamos, Phys. Rev. 100, 1302 (1955); 95, 636A (1954).

$Xe^{130}_{54\ 76}$

Level $Xe^{(130)}(\alpha,\alpha'\gamma)$ E_α = 6.5

γ 0.530 scin

N.P.Heydenburg, G.M.Temmer, Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956); verbal report.

$Xe^{131}_{54\ 77}$ 12^d

Charges 1 to 21 (av.= 8.0) found on recoils

Charge distribution given s Xe^{131} recoil

A.H.Snell, F.Pleasonton, Bull. Am. Phys. Soc. 1, No. 1, 42, K6 (1956); verbal report.

$Xe^{131}_{54\ 77}$

γ $Xe^{(131)}(\alpha,\alpha'\gamma)$ E_α = 6.5

0.286 scin

0.364

N.P.Heydenburg, G.M.Temmer, Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956).

$Xe^{132}_{54\ 78}$

Level $Xe^{(132)}(\alpha,\alpha'\gamma)$ E_α = 6.5

γ 0.670 scin

N.P.Heydenburg, G.M.Temmer, Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956); verbal report.

$Xe^{134}_{54\ 80}$

Level $Xe^{(134)}(\alpha,\alpha'\gamma)$ E_α = 6.5

γ 0.870 scin

N.P.Heydenburg, G.M.Temmer, Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956); verbal report.

$Cs^{128}_{55\ 73}$ 3.8^m

τ 2.5^m *1* La(480-Mev p) chem

β^+ 2.9

d Ba^{128}

A.N.Murin, B.K.Preobrazhensky, I.A. Yutlandov, M.A.Yakimov, Conf. Acad. Sci. on Peaceful Use of Atomic Energy, Chem. Sci. p. 160 July (1955); Consultants Bureau Trans. p. 101.

$Cs^{129}_{55\ 74}$ 31^h

$\gamma(Xe^{129})$ Cs^{133}(80-Mev p,p4n) chem scin

0.395 *10*

0.55 *3*

B.L.Robinson, R.W.Fink, Phys. Rev. 98, 221, 231A (1955).

$Cs^{131}_{55\ 76}$ 10^d

Continuous γ spectrum in coincidence with K x rays has shape predicted by Morrison and Schiff for E_γ > 0.05

A.Michalowicz, Compt. rend. 242, 108 (1956).

$Cs^{134}_{55\ 79}$ 2.3^y g.s.

β^- sl

28%	0.080 *3*		
3%	0.210 *10*	56%	0.650 *5*
5%	0.409 *44*	8%	0.685 *10*

$\gamma(Ba^{134})$ sl ce, pe

10†	0.204 *5*		
4†	0.475 *3*	72†	0.796 *1*
14†	0.562 *2*	11†	0.802 *1*
12†	0.569 *1*	5†	1.035 *3*
100†	0.604 *1*	3†	1.167 *3*
w	0.658 *3**	5†	1.369 *3*

*Due to Cs^{137} impurity?

H.H.Forster, J.S.Wiggins, Nuovo Cim. 2, 854 (1955).

(1.367 γ)(0.605 γ)(θ) J = 3(or 4 or 2), 2, 0

E.D.Klema, Phys. Rev. 100, 66 (1955).

$Cs^{137}_{55\ 82}$ 27^y

τ $30.0^{y}{}^{+3}_{-4}$ specific activity; 4π ic, ms

F.Brown, G.R.Hall, A.J.Walter, J. Inorg. Nuclear Chem. 1, 241 (1955).

$Cs^{138}_{55\ 83}$ 33^m

$\gamma(Ba^{138})$ $U^{(235)}$(th n,f) chem scin, sπ ce

2%	0.1389 M1*	4%	0.87
1%	0.1931	25%	1.010
2%	0.2289	73%	1.426
3%	0.4106	18%	2.21
26%	0.4626	9%	2.63
8%	0.5495	0.5%	3.34

(1.426 γ)(0.139, 0.411, 0.463, 0.550, 0.87 γ, 1.010 γ) No (1.426 γ)(2.21, 2.63 γ)

(0.229 γ)(2.21 γ) No (0.229 γ)(2.63 γ)

(0.463 γ)(0.139, 0.411, 0.550 γ)

No (0.463 γ)(1.010 γ) (0.139 γ)(0.87 γ)

(1.010 γ)(1.426 γ)(θ) J = 3, 2, 0

*M1 assignment based on α

R.B.Duffield, M.E.Bunker, J.P.Mize, J.W. Starner, Phys. Rev. 100, 1236A (1955); verbal report.

Ba^{131} 56 75 13^d

$Ba^{(130)}$(pile n,γ) chem

(0.495γ)(0.122γ) delay = 4.0$^{m\mu s}$ 3

H. Vartapétian, L. Dick, R. Foucher, N. Perrin, Compt. rend. 242, 103 (1956).

(0.495γ)(0.122γ) delay = 4.1$^{m\mu s}$ 5

C. F. Coleman, Phil. Mag. 96, 1135 (1955).

Ba^{137} 56 81

Levels $Ba^{(137)}$(n,n'γ) 2.6^mBa^{137}

0.66	E_n = 0.5 to 3
1.05	2.25 ?*
1.78	2.38

*Does not feed IT state, other levels do

C. P. Swann, F. R. Metzger, Phys. Rev. 100, 1329 (1955).

Ba^{139} 56 83

Levels $Ba^{(138)}$(d,p) E_d = 7.0, 7.5

1† g.s. Q = 2.493 10 s 90°

1.5† 0.623 8

†Relative intensity for E_d = 7.0

C. H. Paris, W. W. Buechner, P. M. Endt, Phys. Rev. 100, 1317 (1955).

La^{137} 57 80

τ > 10^{5y} d 8.7^{h}Ce

From absence of Ba K,L x rays crit a,pc

A. R. Brosi, B. H. Ketelle, Phys. Rev. 100, 169 (1955).

La^{139} 57 82

ground state

q +0.6 2 S

K. Murakawa, J. Phys. Soc. Japan 10, 927 (1955); Phys. Rev. 98, 1285 (1955).

$La^{(139)}$(α,$\alpha'\gamma$) E_α = 6; scin

No γ with E_γ < 0.6; 0.166 level not E2 excited

N. P. Heydenburg, G. M. Temmer, Phys. Rev. 100, 150 (1955).

Ce 58

Ce(α,$\alpha'\gamma$) E_α = 6; scin

No γ with E_γ < 0.6

N. P. Heydenburg, G. M. Temmer, Phys. Rev. 100, 150 (1955).

Ce^{134} 58 76 72^h

τ 66^h U(480-Mev p) chem

A. P. Vinogradov, I. P. Alimarin, V. I. Baranov, A. K. Lavrukhina, T. V. Baranova, F. I. Pavlotskaya, A. A. Bragina, Y. V. Yakovlev, Conf. Acad. Sci. on Peaceful Use of Atomic Energy, Chem. Sci. p. 97 July (1955); Consultants Bureau Trans. p. 65.

Ce^{137} 58 79 8.7^h g.s.

τ 8.7^h Ce^{136}(slow n,γ) chem

ϵ 100% (La K x ray)/γ crit a,pc

γ(La^{137}) 3% 0.445 α_K ~ 0.02

(0.445γ)(La K x ray) crit a,pc

d 35^hCe^{137}

A. R. Brosi, B. H. Ketelle, Phys. Rev. 100, 169 (1955).

Ce^{137} 58 79 35^h

Ba(48-Mev α) chem; Ce^{136}(pile n,γ)

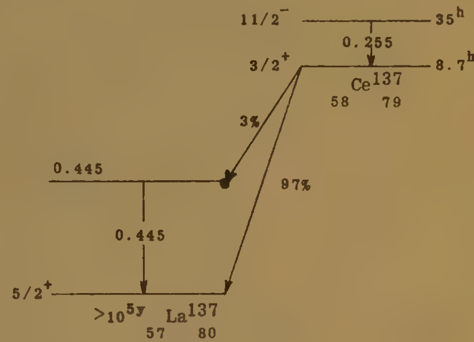
τ 34.5^h 5

γ 0.255 α_K = 5.5 ± 1.5 sl ce,scin

K/L = 2.3 ± 0.2 M4 sl ce

x Ce K x ray crit a,pc

p 8.7^hCe^{137}



A. R. Brosi, B. H. Ketelle, Phys. Rev. 100, 169 (1955).

Ce^{139} 58 81 140^d

γ(La^{139}) (0.166) E2/M1 ~ 0.04 $\gamma(\theta,T)$

$\gamma(\theta,T)$ consistent with J = 3/2 $\lesssim$ 5/2 $\not\approx$ 7/2

E. Ambler, R. P. Hudson, G. M. Temmer, Phys. Rev. 101, 196 (1956).

Ce^{141} 58 83 33^d

γ(Pr^{141}) $Ce^{(140)}$(pile n,γ)

(0.145) E2/M1 = 0.007 3

$\gamma(\theta,T)$ and $\gamma(\perp,T)$ studied for aligned Ce

C. F. M. Cacho, M. A. Grace, C. E. Johnson, A. C. Knipper, R. G. Scurlock, R. T. Taylor, Phil. Mag. 46, 1287 (1955).

Ce^{143} 58 85 33^h

τ 33.4^h Ce^{142}(n,γ)

β^-	6%	~0.22	sd; scin β(1.10γ)
	12%	0.50 3	sd; scin β(0.86γ)
	5%	0.74 15	sd; scin β(0.67γ)
	40%	1.125 15	sd; scin β(0.29γ)
	37%	1.40 2	sd; scin β(0.06γ)

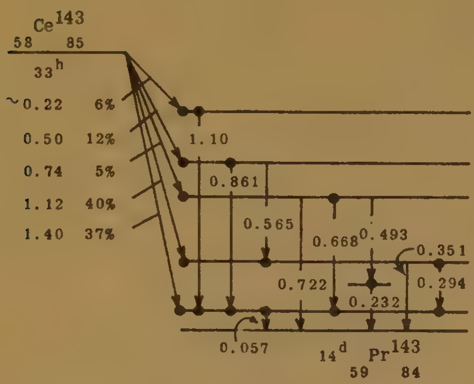
γ(Pr^{143}) 0.0574 2 α_K = 5.9 M1* sπ ce, scin

0.232 1	
0.294 1	0.668 2
0.351 1	0.722 2
0.493 2	0.861 5
0.565 5**	1.10 1§

Continued

Ce^{143} 58 85 33^h

(0.057 γ)(0.294, 0.668, 0.861, 1.10 γ)
(0.232 $\gamma\gamma$)(0.493 γ) (0.294 γ)(0.565 γ)
No other $\gamma\gamma$ coincidences observed
No 1.46 β (< 2%) scin β, $\beta\gamma$
No 0.126, 0.160 γ
* L_2 ce not observed
** Observed only in (0.294 γ) γ spectrum scin
$ ce not observed



D.W.Martin, M.K.Brice, J.M.Cork, S.B.Burson, Phys. Rev. 101, 182 (1956).

Pr^{141} 59 82

ground state

J	5/2	para
$\lvert\mu\rvert$	3.9 2	

J.M.Baker, B.Bleaney, Proc. Phys. Soc. 68A, 936 (1955).

$Pr^{141}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$; scin
No γ with $E_\gamma < 0.6$; 0.145 level not E2 excited

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 100, 150 (1955).

Pr^{143} 59 84 14^d

τ	13.95^d	$Ce^{142}(n,\gamma\beta)$
β^-	0.93 *1*	sd

D.W.Martin, M.K.Brice, J.M.Cork, S.B.Burson, Phys. Rev. 101, 182 (1956).

Nd^{143} 60 83

$Nd^{143}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$; scin
No γ with $E_\gamma < 0.6$

N. P. Heydenburg, G.M.Temmer, Phys. Rev. 100, 150; 98, 1198A (1955).

Nd^{145} 60 85

γ $Nd^{145}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$; scin
0.070 *1* $\epsilon B(E2) \sim 0.03$

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 100, 150; 98, 1198A (1955).

Nd^{146} 60 86

Level $Nd^{146}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$; scin
γ 0.455 *5* $\epsilon B(E2) = 0.84$

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 100, 150; 98, 1198A (1955).

Nd^{147} 60 87

ground state

J	9/2	$\gamma(\theta,T)$
$\lvert\mu\rvert$	0.22 *5*	

$\gamma(Pm^{147})$ (0.092) E2/M1 ~ 0.03 $\gamma(\theta,T)$
(0.530) E2 = 100%
$\gamma(\theta,T)$ shows $J = 9/2 \xrightarrow{\beta} 9/2 - (0.530\,\gamma) \rightarrow 5/2$

E. Ambler, R.P.Hudson, G.M.Temmer, Phys. Rev. 101, 196 (1956); 97, 1212; 98, 230A (1955).

Nd^{148} 60 88

Level $Nd^{148}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$; scin
γ 0.300 *3* $\epsilon B(E2) = 1.50$

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 100, 150; 98, 1198A (1955).

Nd^{150} 60 90

Level $Nd^{150}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$; scin
γ 0.128 *1* $\epsilon B(E2) = 1.24$

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 100, 150; 98, 1198A (1955).

Sm^{143} 62 81 8^m

τ	8.3^m *3*	$Sm^{(144)}$($\leq$30-Mev n,2n)
β^+	2.3 *3*	a
No γ with $E_\gamma > 0.15$		scin

M.Mirnik, A.H.W.Aten,Jr., Physica 22, 14 (1956).

Sm^{147} 62 85

$Sm^{147}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$; scin
No γ with $E_\gamma < 0.6$

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 100, 150; 98, 1198A (1955).

Sm^{148} 62 86

Level $Sm^{148}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$; scin
γ 0.562 *6* $\epsilon B(E2) = 2.06$

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 100, 150; 98, 1198A (1955).

Level $Sm^{148}(p,p'\gamma)$ $E_p = 2.9$; scin
γ 0.55 *5* $\epsilon B(E2) = 0.74$

H.Mark, G.T.Paulissen, Phys. Rev. 100, 813 (1955).

Level $Sm^{148}(p,p'\gamma)$ $E_p = 3.29$; scin
γ 0.562 *8*

B.E.Simmons, K.F.Famularo, G.D.Freier, Phys. Rev. 100, 1265A (1955).

Sm^{149} 62 87

$Sm^{149}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$; scin
No γ with $E_\gamma < 0.6$

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 100, 150; 98, 1198A (1955).

Sm^{150} 62 88

Level $Sm^{150}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$; scin
γ 0.337 *3* $\epsilon B(E2) = 2.32$

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 100, 150; 98, 1198A (1955).

Sm^{150} 62 88

Level $Sm^{150}(p,p'\gamma)$ $E_p = 2.9$; scin
γ 0.335 *17* $\epsilon B(E2) = 0.51$

H. Mark, G. T. Paulissen, Phys. Rev. 100, 813 (1955).

Level $Sm^{150}(p,p'\gamma)$ $E_p = 2.61$; scin
γ 0.337 *3* $p,\gamma(\theta)$ studied

B. E. Simmons, K. F. Famularo, G. D. Freier, Phys. Rev. 100, 1265A (1955).

Capture γ's $Sm^{(149)}$(th n,γ) sπ Cp

38†	0.33 *1*		~4.15 *10*
33†	0.44 *1*		~4.25 *10*
12†	0.60 *1*		~4.40 *10*
7†	0.67 *2*		~4.50 *10*
19†	0.76 *1*	>0.15†	4.65 *10*
	0.90 *3*		4.8 *1*
	0.95 *3*		5.0 *1*
3†	1.07 *2*	>0.5†	5.60 *5*
7†	1.20 *2*		~5.9 *1*
>2†	1.27 *3*	>0.3†	6.00 *5*
>5†	1.35 *2*	~0.35†	6.54 *10*
	~1.50 *5*	~0.06†	6.80 *5*
	~1.60 *5*	0.7†	7.22 *3*

Level scheme implies $B_n = 8.00$ *3*
Levels proposed at 0.33, 0.77, 1.20, 1.43, 1.54, 2.00, 2.30, 3.35
Lines between 1.60 and 4.15 not resolved
†Photons/100 Sm captures

B. P. Adyasevich, B. D. Groshev, A. M. Demidov, Conf. Acad. Sci. USSR on Peaceful Use of Atomic Energy, Phys. Math. Sci. p. 270 July (1955); Consultants Bureau Trans. p. 195.

Sm^{152} 62 90

Level $Sm^{152}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$; scin
γ 0.122 *1* $\epsilon B(E2) = 1.36$

N. P. Heydenburg, G. M. Temmer, Phys. Rev. 100, 150; 98, 1198A (1955).

Level $Sm^{152}(p,p'\gamma)$ $E_p = 2.9$; scin
γ 0.125 *6* $\epsilon B(E2) = 0.43$

H. Mark, G. T. Paulissen, Phys. Rev. 100, 813 (1955).

Level $Sm^{152}(p,p'\gamma)$ $E_p = 2.28$; scin
γ 0.124 *2* $p,\gamma(\theta)$ studied

B. E. Simmons, K. F. Famularo, G. D. Freier, Phys. Rev. 100, 1265A (1955).

Sm^{153} 62 91 47^h

β^- 0.06% 0.130 32% 0.720 scin
41% 0.645 27% 0.825
$\gamma(Eu^{153})$
680* 0.070 scin
1000* 0.100 0.65* 0.530
0.45* 0.170 0.15* 0.600

Continued

Sm^{153} 62 91 47^h

$(0.53\,\gamma)(0.07, 0.10\,\gamma)$ $(0.10\,\gamma)(0.07, 0.60\,\gamma)$
No $(0.60\,\gamma)(0.07\,\gamma)$
*Estimated relative transition probabilities

V. S. Dubey, C. E. Mandeville, N. A. Rothman, Bull. Am. Phys. Soc. 1, No. 4, 164 B12 (1956); verbal report.

Sm^{154} 62 92

Level $Sm^{154}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$; scin
γ 0.082 *1* $\epsilon B(E2) = 0.48$

N. P. Heydenburg, G. M. Temmer, Phys. Rev. 100, 150; 98, 1198A (1955).

Level $Sm^{154}(p,p'\gamma)$ $E_p = 2.9$; scin
γ 0.084 *4* $\epsilon B(E2) = 0.27$

H. Mark, G. T. Paulissen, Phys. Rev. 100, 813 (1955).

Level $Sm^{154}(p,p'\gamma)$ $E_p = 2.07$; scin
γ 0.085 *3* $p,\gamma(\theta)$ studied

B. E. Simmons, K. F. Famularo, G. D. Freier, Phys. Rev. 100, 1265A (1955).

Eu^{151} 63 88

Levels $Eu^{151}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.5$ scin
0.195 level
γ 0.195 $\epsilon B(E2) = 0.067$
0.304 level
γ 0.110 $\epsilon B(E2) = 0.024$
0.195
0.304 $\epsilon B(E2) = 0.22$

N. P. Heydenburg, G. M. Temmer, Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956); verbal report.

γ $Eu^{(151)}(p,p'\gamma)$ $E_p = 2.9$; scin
0.300 *15*

H. Mark, G. T. Paulissen, Phys. Rev. 100, 813 (1955).

Eu^{152} 63 89 13^y g.s.

β^- 2% 1.000 sl
13% 1.460
$\gamma(Sm^{152})$ sl ce, scin

59%	0.122		
9%	0.244	14%	0.963
5%	0.442	13%	1.085
0.5%	0.550	12%	1.110
1%	0.720	2%	1.210
6%	0.866	25%	1.405

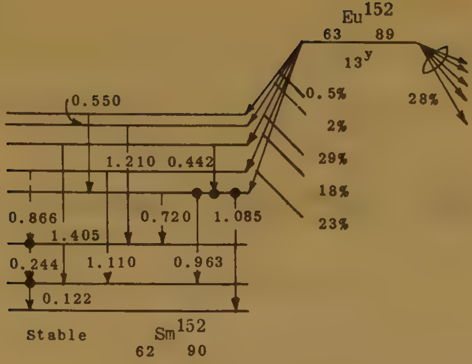
$\gamma(Gd^{152})$

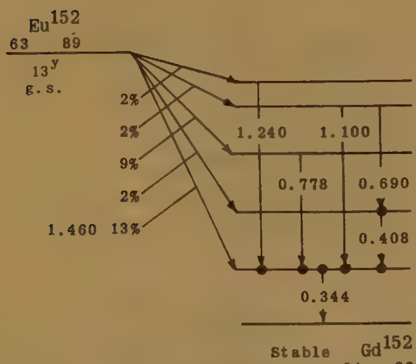
27%	0.344	9%	0.778
2.5%	0.408	1.5%	1.100
0.3%	0.690	2%	1.240

$(0.122\,\gamma)(0.963, 1.110, 1.405\,\gamma)$
$(0.244\,\gamma)(0.866, 1.210\,\gamma)$
$(0.442\,\gamma)(0.963, 1.085\,\gamma)$
$(0.344\,\gamma)(0.778, 1.100, 1.240\,\gamma)$
$(0.408\,\gamma)(0.344, 0.690\,\gamma)$
$(1.00\,\beta)(0.408\,\gamma)$ $(1.46\,\beta)(0.344\,\gamma)$ scin

Continued

Eu^{152}_{63} 89
13^y
g.s.

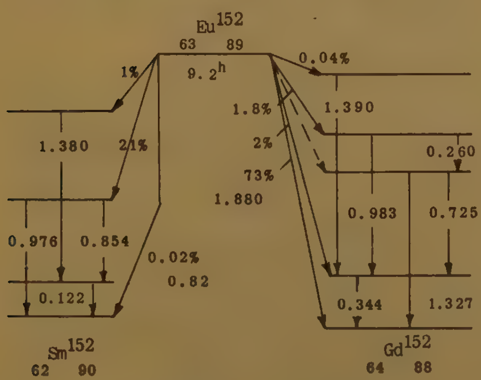




L. Grodzins, H. Kendall, Bull. Am. Phys. Soc. 1, No. 4, 163 B10, 164 B11 (1956); verbal report.

Eu^{152}_{63} 89
9.2^h

β^+		0.82 *10*		scin
β^-		1.880		sl
$\gamma(Sm^{152})$				sl ce, scin
	15.2%	0.122	6.7%	0.976
	14.2%	0.854	1.0%	1.380
$\gamma(Gd^{152})$				
	0.1%	0.260	0.5%	0.983
	2.7%	0.344	1.2%	1.327
	0.1%	0.725	0.04%	1.390



L. Grodzins, H. Kendall, Bull. Am. Phys. Soc. 1, No. 4 163 B10, 164 B11 (1956); verbal report.

Eu^{153}_{63} 90

Levels	$Eu^{153}(\alpha,\alpha'\gamma)$		$E_\alpha = 6.5$ scin
	0.082 level		
γ	0.082	$\epsilon B(E2) = 0.60$	
	0.187 level		
γ	0.082		
	0.105	$\epsilon B(E2) = 0.18$	
	0.187	$= 0.29$	

N. P. Heydenburg, G. M. Temmer, Bull. Am. Phys. Soc. 1, No. 4, 164 C3 (1956); verbal report.

Levels	$Eu^{(153)}(p,p'\gamma)$		$E_p = 2.9$; scin
	0.085 level		
γ	0.085 *4*	$\epsilon B(E2) = 0.20$	
	0.200 level		
γ	0.085 *4*		
	0.115 *6*		
	0.200 *10*	$\epsilon B(E2) = 0.14$	

H. Mark, G. T. Paulissen, Phys. Rev. 100, 813 (1955).

Eu^{155}_{63} 92
1.7^y

β^-	79%	0.150 *10*	scin
	21%	0.240 *10*	
$\gamma(Gd^{155})$		0.018	scin
		0.084	
		0.102	

No $(0.24\beta)\gamma$

V. S. Dubey, C. E. Mandeville, M. A. Rothman, Bull. Am. Phys. Soc. 1, No. 4, 164 B12 (1956); verbal report.

Gd^{153}_{64} 89
236^d

$\gamma(Eu^{153})$	(0.103)	$\alpha = 1.2$	Σ scin
No ϵ to g.s.	(<10%)		Σ scin

S. G. Cohen, Y. Burde, S. Ofer, Bull. Research Council Israel 5A, 87A (1955).

Gd^{154}_{64} 90

Level	$Gd^{154}(\alpha,\alpha'\gamma)$		$E_\alpha = 6$; scin
γ	0.123 *1*	$\epsilon B(E2) = 2.10$	

N. P. Heydenburg, G. M. Temmer, Phys. Rev. 100, 150; 98, 1198A (1955); verbal report.

Level	$Gd^{154}(p,p'\gamma)$		$E_p = 1.9$; scin
γ	0.123* *6*	$\epsilon B(E2) = 1.0$	

*Composite γ

H. Mark, G. T. Paulissen, Phys. Rev. 100, 813 (1955).

Gd^{155}_{64} 91

	ground state	
J	3/2*	enriched Gd^{155}; S
μ	-0.31	

*Value consistent with theory for deformed nuclei$, not with shell model prediction

F. A. Jenkins, D. R. Speck, Phys. Rev. 100, 973A (1955); $B. R. Mottelson, S. G. Nilsson, Phys. Rev. 99, 1615 (1955).

Gd^{155} 64 91 — γ — $Gd^{155}(\alpha,\alpha'\gamma)$ — $E_\alpha = 6$; scin

0.145 *1* — $\epsilon B(E2) = 0.112$*

*Assuming this γ is from a postulated 2nd excited state at 0.21

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 100, 150; 98, 1198A (1955).

γ — $Gd^{155}(p,p'\gamma)$ — $E_p = 2.9$; scin

0.140 *14*

H.Mark, G.T.Paulissen, Phys. Rev. 100, 813 (1955).

Gd^{156} 64 92 — Level / γ — $Gd^{156}(\alpha,\alpha'\gamma)$ — $E_\alpha = 6$; scin

0.089 *1* — $\epsilon B(E2) = 1.24$

N.P. Heydenburg, G.M. Temmer, Phys. Rev. 100, 150; 98, 1198A (1955).

Level / γ — $Gd^{156}(p,p'\gamma)$ — $E_p = 1.9$; scin

0.089 *5* — $\epsilon B(E2) = 0.74$

H. Mark, G.T. Paulissen, Phys. Rev. 100, 813 (1955).

Gd^{157} 64 93 — ground state

J — 3/2* — enriched Gd^{157}; S

μ — **-0.38**

*Value consistent with theory for deformed nuclei$, not with shell model prediction

F.A. Jenkins, D.R. Speck, Phys. Rev. 100, 973A (1955) $B.R.Mottelson, S.G.Nilsson, Phys. Rev. 99, 1615 (1955).

γ — $Gd^{157}(\alpha,\alpha'\gamma)$ — $E_\alpha = 6$; scin

0.131 *1* — $\epsilon B(E2) = 0.083$*

*Assuming this γ is from a postulated 2nd excited state at 0.19

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 100, 150; 98, 1198A (1955).

γ — $Gd^{157}(p,p'\gamma)$ — $E_p = 2.9$; scin

0.127 *13*

H.Mark, G.T.Paulissen, Phys. Rev. 100, 813 (1955).

Gd^{158} 64 94 — Level / γ — $Gd^{158}(\alpha,\alpha'\gamma)$ — $E_\alpha = 6$; scin

0.079 *1* — $\epsilon B(E2) = 1.02$

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 100, 150; 98, 1198A (1955); verbal report.

Level / γ — $Gd^{158}(p,p'\gamma)$ — $E_p = 1.9$; scin

0.080 *4* — $\epsilon B(E2) = 0.63$

H.Mark, G.T.Paulissen, Phys. Rev. 100, 813 (1955).

Gd^{160} 64 96 — Level / γ — $Gd^{160}(\alpha,\alpha'\gamma)$ — $E_\alpha = 6$; scin

0.076 *1* — $\epsilon B(E2) \sim 1$

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 100, 150 (1955).

Level / γ — $Gd^{160}(p,p'\gamma)$ — $E_p = 1.9$; scin

0.076 *4* — $\epsilon B(E2) = 0.73$

H.Mark, G.T.Paulissen, Phys. Rev. 100, 813 (1955).

Tb^{158}? 65 93, 11^s — τ — **11^s** — $Tb^{159}(\gamma)$

x — **Tb K x ray** — scin

M.G.Stewart, A.J.Bureau, C.L.Hammer, Bull. Am. Phys. Soc. 1, No. 4, 206 R2 (1956); verbal report.

Tb^{159} 65 98 — Level — $Tb^{159}(\alpha,\alpha'\gamma)$ — $E_\alpha = 6$; scin

0.136 level

γ — 3.3† — **0.079** *1* — $\epsilon B(E2) = 0.19$

1† — **0.136** *1* — $= 0.041$

Yields show that both γ's are from 0.136 level

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 100, 150; 98, 1198A (1955); Bull. Am. Phys. Soc. 1, No.1, 43, K11 (1956); verbal report.

γ — $Tb^{159}(p,p'\gamma)$ — $E_p = 2.9$; scin

0.077 *4*

Also observed 0.17 γ; Er or Dy impurity?

H.Mark, G.T.Paulissen, Phys. Rev. 100, 813 (1955).

Dy 66 — Levels / γ — $Dy(\alpha,\alpha'\gamma)$ — $E_\alpha = 6$; scin

0.076 *1* — $\epsilon B(E2) = 0.23$*

0.166 *2* — $= 0.29$$

*Assuming γ due to A = 161, 162, 163 and 164

$Assuming γ due to A = 161 and 163

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 100, 150 (1955).

Dy^{165} 66 99, 2.3^h g.s. — $\gamma(Ho^{165})$ — **(0.095)** — M1 — scin

$\alpha_K = 2.9$ *3* — K x ray/γ

T.Stribel, Z. Naturf. 10a, 894 (1955).

Ho^{163}? 67 96, $\sim 1^s$ — τ — $\sim 1^s$ — $Ho^{165}(\geq 16.3\text{-Mev } \gamma)$

γ — **0.305** — scin

M.G.Stewart, A.J.Bureau, C.L.Hammer, Bull. Am. Phys. Soc. 1, No. 4, 206 R2 (1956); verbal report.

Ho^{165} 67 98

ground state

J	7/2	para
$\|\mu\|$	3.29 *17*	
$\|q\|$	~2	μ and q have same sign

J.M.Baker, B.Bleaney, Proc. Phys. Soc. 68A, 1090 (1955).

Level $Ho^{165}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$

0.206 level

γ	100†	0.112	scin
	21†	0.206	

G.M.Temmer, N.P.Heydenburg, Bull. Am. Phys. Soc. 1, No. 1, 43, K11 (1956); verbal report.

Levels $Ho^{165}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$; scin

γ	0.094 *1*	$\epsilon B(E2) = 0.54$
	0.206 *2*	$= 0.036$

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 100, 150 (1955).

Er 68

Levels $Er(\alpha,\alpha'\gamma)$ $E_\alpha = 6$; scin

γ	0.079 *1*	$\epsilon B(E2) = 0.48^*$
	0.172 *2*	$= 0.081^\$$

*Assuming γ due to all stable Er isotopes
$Assuming γ due to A = 167

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 100, 150 (1955).

Er^{167}? 68 99 2.5^s

τ	2.5^s	Er(γ)
γ	0.210	scin

M.G.Stewart, A.J.Bureau, C.L.Hammer, Bull. Am. Phys. Soc. 1, No. 4, 206 R2 (1956); verbal report.

τ	2.5^s	Er(pile n)
γ	0.210 *10* $\alpha_K = 0.55$ *10* E3	scin

E.C.Campbell, J.H.Kahn, M.Goodrich, ORNL-1164 (1951).

Tm^{169} 69 100

ground state

J	1/2	S
μ	-0.205 *20*	

μ agrees very well with the predictions of the collective model of the nucleus*

K.H.Lindenberger, Z. Phys. 141, 476 (1955); Naturwiss. 42, 41 (1955). *B.R.Mottelson, S.G.Nilsson, Z. Phys. 141, 217 (1955).

Level $Tm^{169}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$; scin

0.120 level

γ 0.109 *1* $\epsilon B(E2) = 1.12^*$

*Assuming cascade transition from 0.120 level

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 100, 150 (1955).

Tm^{170} 69 101 127^d

$\gamma(Yb^{170})$ 0.08426 *2* cryst

E.N.Hatch, F.Boehm, J.W.M.DuMond, priv. comm. (1955).

Yb 70

Levels $Yb(\alpha,\alpha'\gamma)$ $E_\alpha = 6$; scin

γ	0.078 *1*	$\epsilon B(E2) = 0.28^*$
	0.110 *1*	$= 0.20^\$$
	0.180 *2*	$= 0.086$++

*Assuming γ due to A = 170 172, 173, 174, 176
$Assuming γ due to A = 171
++Assuming γ due to A = 173

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 100, 150 (1955).

Yb^{169} 70 99 31^d

τ 30.6^d *2* $Yb^{(168)}$(pile n,γ)

$\gamma(Tm^{169})$ sπ ce

	K	L_1	L_2	L_3	
0.0084					
0.0206*		100	43	55	
0.0632					
0.0936	210	100	18	10	
0.1099	360	100	19	6	
0.1183	9		10		E2
0.1307	14		10	9	E2
0.1777	56	10			
0.1986	66	10			
0.2610					
0.3083	35		10		E2

(~0.115 γ)(~0.115; ~0.190, 0.261 γ) scin
(0.177 γ)(0.130 γ) (0.261 γ)(~0.115 γ)
(K x ray?)(0.308 γ)
*Only ce_{L_1} observed ∴M1

J.M.Cork, M.K.Brice, D.W.Martin, L.C.Schmid, R.G.Helmer, Phys. Rev. 100, 1237A (1955); verbal report.

$\gamma(Tm^{169})$ sl ce,cryst

	α_K		α_K
0.00842			
0.02075			
0.06312		0.17724	0.51
0.09360	2.4	0.19797	0.40
0.10978	2.1	0.2404	
0.11820		0.2610	
0.13053		0.3077	

All γ's fitted into levels at 0.00842, 0.11820, 0.13895, 0.31619, 0.37931, 0.47291

E.N.Hatch, P.Marmier, F.Boehm, J.W.M.DuMond, Bull. Am. Phys. Soc. 1, No. 4, 170 E1 (1956); verbal report.

$\gamma(Tm^{169})$ $Yb^{(168)}$(pile n,γ) scin

20%$	(0.023)	146+	0.178
250+	0.064		~0.194*
34+	0.094	214+	0.198
144+	0.110		~0.240*
	~0.120*		~0.260*
91+	0.133	60+	0.308
x 1130+	K x ray		

(0.110 γ)(0.178, 0.198, ~0.260 γ)
(0.133 γ)(0.178, ~0.194, ~0.240 γ)
(0.198 γ)(0.110, ~0.120 γ)

Continued

Yb^{169} 70 99 31^d

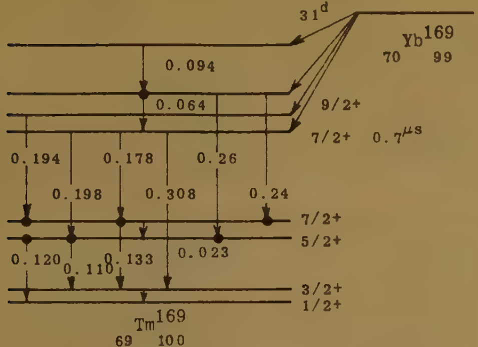
Only 0.064 γ and 0.094 γ precede 0.7$^{\mu s}$ level $\gamma\gamma$ delay

No ϵ to 0.120 or 0.142 level xγ delay

*Observed only in coincidence spectra

$From intensities of (0.110 γ)γ and (0.178 γ) γ

+Photons per 10^3 disintegrations



S. A. E. Johnsson, Phys. Rev. 100, 835 (1955).

Yb^{171} 70 101

	ground state	
μ	+0.49 *6*	S

K. Krebs, H. Nelkowski, Z. Phys. 141, 254 (1955).

Yb^{173} 70 103

	ground state	
J	5/2	S
μ	−0.67 *1*	

K. Krebs, H. Nelkowski, Z. Phys. 141, 254 (1955). Ann. Physik 15, 124 (1954).

Yb^{175} 70 105 4.2^d

τ		4.2^d *1*		$Yb^{(174)}$(pile n,γ)
β^-	~25+	0.374 *30*		sd
	100+	0.471 *3*		
$\gamma(Lu^{175})$		0.1141	K/L = 2.9	sπ ce
			$L_1 : L_2 : L_3$ = 100 : 41 : 27	
		0.1378	K/L ~ 2	
		0.1450		
		0.2829	K/L_2 ~ 6	
		0.3970	K/L = 5.4	

J. M. Cork, M. K. Brice, D. W. Martin, L. C. Schmid, R. G. Helmer, Phys. Rev. 100, 1237A (1955); verbal report.

$\gamma(Lu^{175})$ sl ce, cryst

0.11381	0.2513
0.13765	0.28257
0.14485	0.3961

All γ's fitted into levels at 0.11381, 0.25146, 0.39631

F. Boehm, E. N. Hatch, P. Marmier, J. W. M. DuMond, Bull. Am. Phys. Soc. 1, No. 4, 170 (1956).

Yb^{175} 70 105 4.2^d

$\gamma(Lu^{175})$ 0.39532 *12* cryst

N. Ryde, B. Andersson, Proc. Phys. Soc. 68B, 1117 (1955).

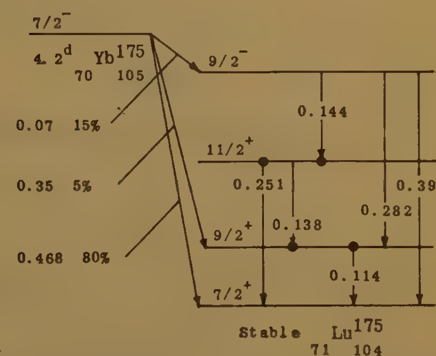
β^-	15%	0.070 *10*		scin$\beta\gamma$
	5%	0.350 *10*		scin$\beta\gamma$
	80%	0.468 *5*		sl
No 0.317 β (< 0.5%)				scin$\beta\gamma$
$\gamma(Lu^{175})$				scin, sπ ce
	7†	0.1136 *2*	α_K = 1.7 *4* *	
			$L_1:L_2:L_3$ = 3:1:1	E2/M1 = 0.30
	< 1†	0.1376 *2*		
	< 2†	0.144		
	< 1†	0.251		M2/E1
	10†	0.2824 *2*	α_K = 0.038 *10*	0.03
			K/LM ≥ 5	
	23†	0.3960 *2*	α_K = 0.050 *5*	0.20
			K/LM = 5.8	

(0.07 β)(0.282, 0.396 γ) scin

(0.35 β)(0.114 γ)

(0.144 γ)(0.114, 0.138, 0.251 γ)

*From (0.282 γ)(K x ray, 0.114 γ)



J. P. Mize, M. E. Bunker, J. W. Starner, Phys. Rev. 100, 1390 (1955); 99, 671A (1955).

Yb^{177} 70 107 1.8^h

τ		1.88^h *10*	$Yb^{(176)}$(pile n,γ)
$\gamma(Lu^{177})$			
	~25+	0.119	scin$\beta\gamma$
	100+	0.148	scin
	~5+	1.080	
	~5+	1.228	

(E_β > 0.5)(0.119 γ) scin

(1.080 γ)(0.148 γ) No (1.228 γ)(0.148 γ)

Not p 6.8^dLu^{177} (expected decay, ce, and β not observed)

J. M. Cork, M. K. Brice, D. W. Martin, L. C. Schmid, R. G. Helmer, Phys. Rev. 100, 1237A (1955); verbal report.

Lu ? 71

γ Lu(γ,?γ)

0.131 $\gamma\gamma$ delay = 75$^{\mu s}$ scin

M. G. Stewart, A. J. Bureau, C. L. Hammer, Bull. Am. Phys. Soc. 1, No. 4, 206, R2 (1956); verbal report.

$Lu^{175}_{71\ 104}$ Levels $Lu^{(175)}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$; scin

γ 0.114 *1* $\epsilon B(E2) = 0.72$

0.250 *3* $= 0.20$

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 100, 150 (1955).

Level $Lu^{(175)}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$

0.250 level

γ 100† 0.136 scin

92† 0.250

G.M.Temmer, N.P.Heydenburg, Bull. Am. Phys. Soc. 1, No. 1, 43, K11 (1956); verbal report.

$Lu^{176}_{71\ 105}$ Level $Lu^{(176)}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$; scin

γ 0.180 2 $\epsilon B(E2) = 1.14$

Assignment to Lu^{175} also possible

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 100, 150 (1955).

$Lu^{177}_{71\ 106}$ 6.8^d $\gamma(Hf^{177})$ 0.11308 *3* cryst

0.20786 *4*

N.Ryde, B.Andersson, Proc. Phys. Soc. 68B, 1117 (1955).

$Lu^{177}_{71\ 106}$ Resonances $Lu^{(176)}(n)$ $E_n = 0.06$ to 3 ev

E_o(ev)	σ_o	Γ_γ(mev)	$g\Gamma_n$(mev)
0.143 *1*	14400	61 *2*	0.046
1.574 *6**	8300	55 *5*	0.26 *3*
2.604 *10*$	79000	50 *1*	4.5 *1*

*Assignment to Lu^{176} possible

$Assignment based on activation of 6.8^{d}Lu

H.H.Landon, Phys. Rev. 100, 1414 (1955); 92, 656 (1953).

$Hf^{175}_{72\ 103}$ 70^d $\gamma(Lu^{175})$ $Hf^{174}(n,\gamma)$; scin, sπce,

4† 0.0893 2

$L_1:L_2:L_3 = 10:1:1$ E2/M1 = 0.1

0.1136 2

~1† 0.2293 2 K/L~2

0.3186 2

100† 0.3429 2

$L_1:L_2:L_3 = 10:0:0$ E2/M1 ≤ 0.25

K/LM = 5.0

~2† 0.4322 2

(0.343γ)(K x ray, 0.089 γ) and relative photon intensities indicate ~20% ϵ to 0.432 level, ~80% ϵ to 0.343 level, <10% ϵ to g.s.

J.P.Mize, M.E.Bunker, J.W.Starner, Phys. Rev. 100, 1390 (1955).

$Hf^{175}_{72\ 103}$ 70^d $\gamma(Lu^{175})$ 0.08936 sl ce, cryst

0.11381 0.3189

0.16133 0.34340

0.22957 0.4328

0.06169 photon interpreted as Lu $K_{\beta 5}$ x ray

All γ's fitted into levels at 0.11381, 0.34340, 0.43276, 0.50473

F.Boehm, E.N.Hatch, P.Marmier, J.W.M.DuMond, Bull. Am. Phys. Soc. 1, No. 4, 170 E2 (1956); verbal report.

$Hf^{176}_{72\ 104}$ Level $Hf^{176}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$; scin

γ 0.087 *1* $\epsilon B(E2) = 0.56$

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 100, 150; 98, 1198A (1955).

$Hf^{177}_{72\ 105}$ Levels $Hf^{177}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$; scin

γ 0.112 *1* $\epsilon B(E2) = 0.77$

0.250 *3* $= 0.55$

H.P.Heydenburg, G.M.Temmer, Phys. Rev. 100, 150; 98, 1198A (1955).

Level $Hf^{177}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$

0.250 level

γ 10† 0.138 scin

48† 0.250

G.M.Temmer, N.P.Heydenburg, Bull. Am. Phys. Soc. 1, No. 1, 43, K11 (1956); verbal report.

$Hf^{178}_{72\ 106}$ Level $Hf^{178}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$; scin

γ 0.090 *1* $\epsilon B(E2) = 0.85$

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 100, 150; 98, 1198A (1955).

$Hf^{179}_{72\ 107}$ Levels $Hf^{179}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$; scin

γ 0.119 *1* $\epsilon B(E2) = 0.67$

0.260 *3* $= 0.056$

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 100, 150; 98, 1198A (1955).

Level $Hf^{179}(\alpha,\alpha'\gamma)$ $E_\alpha = 6$

0.260 level

γ 100† 0.141 scin

81† 0.260

G.M.Temmer, N.P.Heydenburg, Bull. Am. Phys. Soc. 1, No. 1, 43, K11 (1956); verbal report.

Hf^{180} 72 108 5.5^h

γ	$(0.057)^*$	$L_1L_2/L_3 \sim 5$, $\alpha_L \sim 0.4$ E1	sπ ce
80%	(0.444)		sl pe
20%	0.501		

*γ lifetime (10^{-15} single proton estimate) ascribed to K-forbiddenness ($\Delta K = 9$)

G.Scharff-Goldhaber, M.McKeown, J.W.Mihelich, Bull. Am. Phys. Soc. 1, No. 4, 206 R3 (1956); verbal report.

Hf^{180} 72 108

Level	$Hf^{180}(\alpha,\alpha'\gamma)$		$E_\alpha = 6$; scin
γ	0.093 *1*	$\epsilon B(E2) = 0.78$	

N.P. Heydenburg, G.M. Temmer, Phys. Rev. 100, 150; 98, 1198A (1955).

Hf^{181} 72 109 46^d

$\gamma(Ta^{181})$	(0.132)	E2 = 100%	$ce_K\gamma(\theta)$,
	(0.480)	E2/M1 = 43.5*	$\gamma\gamma(\theta)$

$(ce_K\ 0.132\ \gamma)(0.480\ \gamma)(\theta)^\$$
$(0.132\ \gamma)(0.480\ \gamma)(\theta)$ } J = 1/2, 5/2, 7/2

*Assuming no quadrupole attenuation of angular correlation coefficients

E. Heer, R. Rüetschi, F. Gimmi, W. Kündig, Helv. Phys. Acta 28, 336A (1955); \$F. Gimmi, E. Heer, P. Scherrer, Helv. Phys. Acta 28, 470A (1955).

$\gamma(Ta^{181})$	(0.132)	M3/E2 = 0.0025	$\gamma ce_K(\theta)$
	(0.480)	E2/M1 = 43.5	
	or		
	(0.132)	E2 = 100%	$\gamma ce_K(\theta)$
	(0.480)	E2/M1 = 9	

$(0.132\ \gamma)(ce_K\ 0.480\ \gamma)(\theta)$ J = 1/2, 5/2, 7/2

Magnetic attenuation of correlation coefficients due to electron rearrangement shown

F. Gimmi, E. Heer, P. Scherrer, Helv. Phys. Acta 28, 470A (1955).

Ta^{180} 73 107

τ	$>10^{12y}$	ms

From abundance of W^{180} in Ta ores

P. Eberhardt, J. Geiss, C. Lang, W. Herr, E. Merz, Z. Naturf. 10a, 796 (1955).

Ta^{181} 73 108

Level	$Ta^{181}(\alpha,\alpha'\gamma)$		$E_\alpha = 3.45$
γ	(0.137)	K/L = 6.3	sπ ce

E.M. Bernstein, H.W. Lewis, Phys. Rev. 100, 1345; 99, 617A (1955).

Levels		$Ta^{181}(p,p'\gamma)$	$E_p = 2.9$; scin	
		0.137 level		
γ		0.137 *3*	$B(E2) = 1.8^*$	(α = 2.1)
		0.302 level		
γ		0.137 *3*		
	1.6†	0.165 *4*		
	1†	0.302 *4*	$B(E2) = 0.5^*$	(α = 0.08)

*Corrected for anisotropy

A.S. Divatia, R.H. Davis, R.D. Moffat, D.A. Lind, Phys. Rev. 100, 1266A (1955); verbal report.

Ta^{181} 73 108

Levels		$Ta^{181}(\alpha,\alpha'\gamma)$	$E_\alpha = 6$; scin
		0.136 level	
γ		0.136 *1*	$\epsilon B(E2) = 0.70$
		0.303 level	
γ		0.136 *1*	
	1.1†	0.167 *2*	
	1†	0.303 *3*	$\epsilon B(E2) = 0.15$

$(0.136\ \gamma)(0.167\ \gamma)$

N.P. Heydenburg, G.M. Temmer, Phys. Rev. 100, 150 (1955); Bull. Am. Phys. Soc. 1, No. 1, 43, K11 (1956); verbal report.

Levels		$Ta^{181}(p,p'\gamma)$	$E_p = 3.7$; scin
		0.137 level	
γ		(0.137)	B(E2) = 1.75
		0.303 level	
γ		(0.137)	
	1.4†	(0.166)	
	1†	(0.303)	

$(0.137\ \gamma)(0.166\ \gamma)$

E.A. Wolicki, L.W. Fagg, E.H. Geer, Phys. Rev. 100, 1265A (1955); verbal report.

Level		$Ta^{181}(p,p'\gamma)$	scin
		0.303 level	
γ		(0.137)	
	1.7†	(0.166)	
	1†	(0.303)	

H. Mark, G. Paulissen, Phys. Rev. 99, 1654A (1955).

	0.480 level	$46^d Hf^{181}$ source
J	5/2	$\gamma\gamma(\theta)$
μ	+3.25 *17*	$\gamma\gamma(\theta,H)$

E. Heer, R. Rüetschi, F. Scherrer, Z. Naturf. 10a, 834 (1955); Helv. Phys. Acta 28, 336A (1955).

γ	$Ta^{181}(n,n'\gamma)$	$E_n = 0.35$ to 3.9
	0.14	0.35 scin
	0.16	0.48
	0.21	0.62

R.B. Day, A.E. Johnsrud, D.A. Lind, Bull. Am. Phys. Soc. 1, No. 1, 56, R9 (1956).

Ta^{182} 73 109

Resonances	$Ta^{181}(n,\gamma)$	chopper
	E_m (ev)	
	(4.28)	0.260 γ observed scin
	(10.38)	0.260 γ observed
	(13.95)	0.260 γ not observed

R.G. Bennett, A.E. Walters, C.A. Fenstermacher, L. Rosler, Bull. Am. Phys. Soc. 1, No. 1, 62, UA5 (1956).

Ta^{182} 73 109

Resonances $Ta^{181}(n,\gamma)$ pulsed n's scin γ

35.5 ev	84.9			
39.2	89.4	126.2	194.5	231.8
49.1	91.1	136.2	199.4	236.4
57.5	96.7	138.1	203.8	241.8
63.0	99.0	143.9	207.9	246.6
76.7	103.3	148.1	215.4	258.4
77.5	105.3	149.4	219.3	263.0
78.7	114.7	166.0	221.6	272.2
82.7	118.0	175.1	224.5	275.7

G. Grimm, J. S. Desjardins, J. Rosen, J. Rainwater, W. W. Havens, Jr., Bull. Am. Phys. Soc. 1, No. 4, 176 F14 (1956); verbal report.

Ta^{186} 73 113 10^m

τ 10.5^m *5* W^{186}(20-Mev n,p) chem not by W($\le$28-Mev γ)

β^- 2.2 scin

$\gamma(W^{186})$ scin

		45†	0.51
25†	0.125	45†	0.61
100†	0.200	65†	0.73
25†	0.300	15†	0.94
20†	0.410	$\le$10†	~1.1

(2.2 β) γ

A. J. Poë, Phil. Mag. 46, 1165 (1955).

W ? 74

γ W(γ,n?γ) $E_\gamma \ge 8.3$; scin
0.366 $\gamma\gamma$ delay = $14.6^{\mu s}$ *3*

M. G. Stewart, A. J. Bureau, C. J. Hammer, Bull. Am. Phys. Soc. 1, No. 4, 206 R2 (1956); verbal report.

γ W(γ,n?γ) $E_\gamma \le 24$; scin
0.370 *15* $\gamma\gamma$ delay = $16^{\mu s}$ *1*
$\alpha \sim 0.25$ x/γ

S. H. Vegors, Jr., P. Axel, Phys. Rev. 101, 1067 (1956).

W^{183} 74 109

Resonance $W^{(182)}(n)$ cryst

E_o(ev)	σ_o	Γ_γ(mev)	Γ_n(mev)
4.14 *3*	19000	46 *2*	1.43 *3*

H. H. Landon, Phys. Rev. 100, 1414 (1955).

Re 75

Resonances Re(n) E_n = 1 to 13 ev cryst

2.156 *4** ev	
4.416 *8*$	11.1
5.90	11.9
7.2	12.8

*Re^{186}, $$Re^{188}$, q. v.

G. Igo, Phys. Rev. 100, 1338; 99, 610A (1955).

Re^{185} 75 110

Levels $Re^{(185)}(p,p'\gamma)$ E_p = 3.2; scin

0.125 level

γ 0.125 *4* B(E2) = 1.2 (α = 4.5)

0.280 level

γ	0.125 *4*	
8†	0.158 *5*	
1†	0.280 *10*	B(E2) = 0.5 (α = 0.15)

R. H. Davis, A. S. Divatia, R. D. Moffat, D. A. Lind, Phys. Rev. 100, 1266A (1955); verbal report.

Levels $Re^{185}(p,p'\gamma)$ E_p = 3.7; scin

0.126 level

γ 0.126 B(E2) = 1.2* (α = 4.5)

0.286 level

γ	0.126
4.0†	0.160
1†	0.286

(0.126 γ)(0.160 γ)

E. A. Wolicki, L. W. Fagg, E. H. Geer, Phys. Rev. 100, 1265A (1955). *verbal report.

Re^{186} 75 111 3.8^d

$\gamma(Os^{186})$ 0.13722 *3* cryst

N. Ryde, B. Andersson, Proc. Phys. Soc. 68B, 1117 (1955).

Re^{186} 75 111

Resonance $Re^{(185)}(n)$ cryst

E_o(ev)	σ_o	Γ_γ(mev)	$g\Gamma_n$(mev)
2.156 *4*	12300	55.7 *6*	3.30 *5*

G. Igo, Phys. Rev. 100, 1338; 99, 610A (1955).

Re^{187} 75 112

Levels $Re^{(187)}(p,p'\gamma)$ E_p = 3.2; scin

0.135 level

γ 0.135 *4* B(E2) = 2.0 (α = 4.5)

0.300 level

γ	0.135 *4*	
5.4†	0.163 *5*	
1†	0.300 *10*	B(E2) = 0.65 (α = 0.15)

R. H. Davis, A. S. Divatia, R. D. Moffat, D. A. Lind, Phys. Rev. 100, 1266A (1955); verbal report.

Levels $Re^{187}(p,p'\gamma)$ E_p = 3.7; scin

0.135 level

γ 0.135 B(E2) = 1.1* (α = 4.5)

0.303 level

γ	0.135
3.8†	0.168
1†	0.303

(0.135 γ)(0.168 γ)

E. A. Wolicki, L. W. Fagg, E. H. Geer, Phys. Rev. 100, 1265A (1955); *verbal report.

Re^{187} 75 112 — Level — $Re^{187}(p,p'\gamma)$ — scin

0.320 level

γ		0.139
	4.7†	0.181
	1†	0.320

H.Mark, G.Paulissen, Phys. Rev. 99, 1654A (1955).

Re^{188} 75 113, 17^h, g.s. — $\gamma(Os^{188})$ — 0.15487 5 — cryst

N.Ryde, B.Andersson, Proc. Phys. Soc. 68B, 1117 (1955).

$\gamma(Os^{188})$ — $Re^{(187)}$(pile n,γ) — scin

101†	0.150	5.8†	0.910
12†	0.480	2.7†	1.130
16†	0.630	2.2†	1.300
0.3†	0.660	2.1†	1.600
6.5†	0.820	1†	1.770

(0.15γ)(0.66γ) No (0.15γ)(0.63γ)
(0.15γ)(0.48γ)(θ) J = 2,2,0 & 0.48 γ 99.5% E2

V.R.Potnis, V.S.Dubey, C.E.Mandeville, Bull. Am. Phys. Soc. 1, No. 1, 42, K7 (1956); verbal report.

Re^{188} 75 113 — Resonance — $Re^{(187)}$(n) — cryst

E_o(ev)	σ_o	Γ_γ(mev)	$g\Gamma_n$(mev)
4.416 8	1560	45 1	0.32 1

G.Igo, Phys. Rev. 100, 1338; 99, 610A (1955).

Os^{185} 76 109, 97^d — $\gamma(Re^{185})$ — scin, sl ce

0.0725	
0.125	
0.162	0.647
0.234	0.875

C.H.Pruett, R.G.Wilkinson, Phys. Rev. 100, 1237A (1955).

Os^{190} 76 114, 10^m — τ — 10^m 2 — d 3.2^hIr chem

scin

γ	75†	0.186
	90†	0.356
	100†	0.510
	92†	0.620
x	23†	K x ray

0.186, 0.356, 0.510, 0.620 γ's in 4-fold coinc.

A.H.W.Aten, Jr., G.D.de Feyfer, M.J.Sterk, A.H.Wapstra, Physica 21, 740, 990 (1955).

Ir 77 — Resonances — Ir(n) — E_n = 0.45 to 30 ev — cryst

E_o(ev)	E_o(ev)
0.654 2*	
1.303 5$	9.9
5.36 4*	~19.5
6.1	~25.5
9.03	~31

*Ir^{192}, $$Ir^{194}$, q.v.

H.H.Landon, Phys. Rev. 100, 1414 (1955); 99, 610A (1955).

Ir^{190} 77 113, 3.2^h — $Ir^{(191)}$ (fast n,2n) — chem, scin

β^+ 2.04 7

p 10^mOs chem

A.H.W.Aten, Jr., G.D.de Feyfer, M.J.Sterk, A.H.Wapstra, Physica 21, 740, 990 (1955).

Ir^{191} 77 114 — Levels — $Ir^{(191)}(p,p'\gamma)$ — E_p = 3.2; scin

0.115 level

γ 2.7† 0.115 4

0.133 level

γ 0.133 4 B(E2) = 0.8 (α = 4.4)

0.356 level

γ		0.133 4		
	1.1†	0.216 6		
	1†	0.356 8	B(E2) = 0.9	(α = 0.04)

R.H.Davis, A.S.Divatia, R.D.Moffat, D.A.Lind, Phys. Rev. 100, 1266A (1955); verbal report.

Ir^{192} 77 115, 74^d, g.s. — $\gamma(Os^{192})$ 0.282, 0.4840 — $Ir^{(191)}$(pile n,γ) — sd pe,ce

$\gamma(Pt^{192})$	0.2870	0.4380
	0.2940	0.4675
	0.3080	0.5900
	0.3160	0.6040
	0.4190	0.6130
γ(?)	0.430	

0.4226 Pb pe ascribed to $\gamma^{\pm}$
Electrons studied in energy range 0.18 to 0.55

F.Grard, L.Danguy, J.Franeau, J. phys. radium 16, 839 (1955).

$\gamma(Pt^{192})$ — cryst

0.29596 10
0.30866 6
0.31652 4
0.46795 12

N.Ryde, B.Andersson, Proc. Phys. Soc. 68B, 1117 (1955).

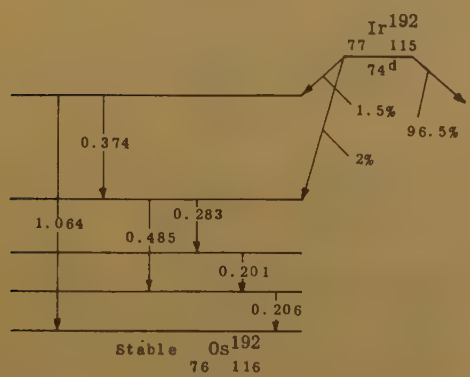
Ir^{192} 77 115 74^d g.s.

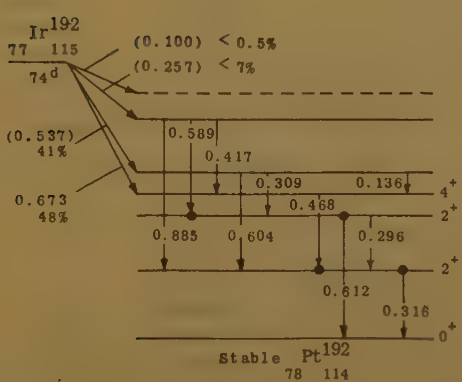
β^- $<0.5\%^*$ $(0.100)^*$ $Ir^{(191)}$(pile n,γ)
$7\%^*$ $(0.257)^*$
$41\%^*$ $(0.537)^*$ $48\%^*$ **0.673** *10* sd
No β^+ ($<10^{-4}\%$) cryst $\gamma^{\pm}$
ϵ $3.5\%^*$ sd ce, cryst

$\gamma(Os^{192})$

			α_K	α_{L1L2}	α_{L3}
4.6†	**0.20131**	*4*	0.30	0.12	0.07
39†	**0.20575**	*4*	0.16	0.077	0.04
6†	**0.28335**	*20*	0.04		
19†	**0.3747**	*5*			
39†	**0.48475**	*23*	0.022		
0.5†	**1.060**	*30*			
1.9†	**0.13633**	*2*	1.0	0.63	0.44
360†	**0.29594**	*9*	0.065	0.025	0.006
350†	**0.30845**	*9*	0.069	0.028	0.008
1000†	**0.31646**	*9*	$(0.054)^{\$}$	0.018	0.006
16†	**0.4166**	*7*	0.019		
640†	**0.46798**	*22*	0.022	0.0052	0.001
71†	**0.5884**	*6*	0.011	0.0031	
140†	**0.6045**	*9*	0.016	0.0031	
84†	**0.6129**	*9*	0.011	0.0023	
1†	**0.785**	*20*			
5†	**0.885**	*2*	0.007		

$(0.468\gamma)(0.316\gamma)(\theta)$ J = 4, 2, 0
$(0.588\gamma)(0.613\gamma)(\theta)$ J = 4, 2, 0
$(\sim 0.30\gamma)(0.885\gamma)$
*Not measured, determined from γ transitions
$ α's based on this theoretical α_K(E2)





L.L.Baggerly, P.Marmier, F.Boehm, J.W.M. DuMond, Phys. Rev. 100, 1364 (1955).

Ir^{192} 77 115

Resonances $Ir^{(191)}$(n) $E_n = 0.45$ to 6 ev

E_o(ev)		σ_o	Γ_γ(mev)		$g\Gamma_n$(mev)	
0.654	2	13800	73.5	*1*	0.25	*1*
5.36	4	24000	67	5	3.6	2

$19^h Ir^{194}$ not produced at these resonances

H.H.Landon, Phys. Rev. 100, 1414 (1955); 99, 610A (1955).

Ir^{193} 77 116

Levels $Ir^{(193)}$(p,p'γ) $E_p = 3.2$; scin

<u>0.143 level</u>
γ **0.143** *4* B(E2) = 1.0 (α = 4.4)
<u>0.368 level</u>
γ **0.143** *4*
0.3† **0.230** *6*
1† **0.368** *8* B(E2) = 0.35 (α = 0.04)

R.H.Davis, A.S.Divatia, R.D.Moffat, D.A.Lind, Phys. Rev. 100, 1266A (1955); verbal report.

Ir^{194} 77 117 19^h g.s.

$\gamma(Pt^{194})$ **0.32907** *8* cryst

N.Ryde, B.Andersson, Proc. Phys. Soc. 68B, 1117 (1955).

Ir^{194} 77 117

Resonance $Ir^{(193)}$(n) $E_n = 0.45$ to 6 ev

E_o(ev)		σ_o	Γ_γ(mev)		$g\Gamma_n$(mev)	
1.303	*5*	10400	86.5	*1*	0.46	*1*

Assignment based on activation of 19^hIr cryst

H.H.Landon, Phys. Rev. 100, 1414 (1955); 99, 610A (1955).

Pt 78

"82^dPt" identified as $76^d Ir^{192}$ chem, scin γ

G.W.Warren, R.W.Fink, Bull. Am. Phys. Soc. 1, No. 4, 171 E4 (1956).

Pt^{193} 78 115 g.s.

τ $<500^{y*}$ Pt^{192}(pile n,γ) chem
ϵ_L a, pc L x ray
$\epsilon_K/\epsilon_L < 0.001$ from absence of K x ray pc
No γ, no particles pc, scin
*Assuming $\sigma = 0.08$

R.A.Naumann, Bull. Am. Phys. Soc. 1, No. 1, 42, K9 (1956).

Pt^{195} 78 117

Levels $Pt^{(195)}(\alpha,\alpha'\gamma)$ $E_\alpha = 4.0$

<u>0.029 level</u>
γ **0.029** scin γ
<u>0.126 level</u> B(E2) $\sim 0.5^*$
γ **0.097** sπ ce
<u>0.210 level</u> B(E2) = 0.5^*
γ **0.210** K/L = 6 sπ ce
<u>0.240 level</u>
γ **(0.240)** $\alpha_K < 0.2$ E2 sπ ce
*Used B(E2) = 0.334 for 0.279 Au^{197} level

E.M.Berstein, H.W.Lewis, Phys. Rev. 100, 1345 (1955).

Pt^{197} 78 119 — Levels — $Au^{197}(n,p)$ — $E_n = 14$; ppl

	Level	Γ
100†	g.s.	1.1
55†	1.53 *15*	1.0
47†	2.52 *15*	1.2
45†	3.96 *15*	0.9
22†	5.77 *15*	1.2
16†	7.22 *15?*	1.0

R. A. Peck, Jr., Bull. Am. Phys. Soc. 1, No. 1, 40, JA8 (1956); verbal report.

Au^{194} 79 115 39^h

$\gamma(Pt^{194})$ 0.290 ~130^d Hg source; sl ce_K
0.330
~1.5 $(ce_K)\gamma$
~2 scin
(ce_K 0.290 γ)(0.330, ~1.5 γ) sl, scin
(ce_K 0.330 γ)(0.290, ~1.5 γ)

J. Brunner, H. Guhl, J. Halter, H. J. Leisi, Helv. Phys. Acta 28, 475A (1955).

Au^{195} 79 116 185^d g.s.

$\gamma(Pt^{195})$ 1† 0.031 $Pt^{(194)}$(15-Mev d,n)
12† 0.099 2† 0.130 scin
(0.099 γ)(K x ray, 0.031 γ)
(K x ray)(0.130 γ) No (0.099 γ)(0.130 γ)

V. R. Potnis, Bull. Am. Phys. Soc. 1, No. 4, 170 E3 (1956); verbal report.

$\gamma(Pt^{195})$ 0.130 sl ce

J. Brunner, H. Guhl, J. Halter, H. J. Leisi, Helv. Phys. Acta 28, 475A (1955).

Au^{195} 79 116 30^s

γ $40^h Hg^{195}$ source
87* 0.0565 α~∞ scin; sπ, sl ce
$L_2 : L_3 : M = 34 : 32 : 22$
19.9* 0.2615 α = 0.25 *3*
K : L : M = 16 : 3 : 0.85
0.25* 0.318 (ce_{LM} only)
*Relative ce intensities

R. Joly, J. Brunner, J. Halter, O. Huber, Helv. Phys. Acta 28, 403 (1955); 26 591A (1953).

Au^{196} 79 117 5.6^d g.s.

$\gamma(Pt^{196})$ 0.330 Au^{197}(33-Mev p,d) chem
0.360 scin
$\gamma(Hg^{196})$ 0.430
(0.330 γ)(0.360 γ)
β(0.430 γ)

J. Brunner, H. Guhl, J. Halter, H. J. Leisi, Helv. Phys. Acta 28, 475A (1955).

Au^{197} 79 118 7.4^s

$Au^{197}(n,n')$, d $23^h Hg^{197}$; sl ce
γ 402* 0.130 K : L : M = 30.5 : 268 : 104
$L_2/L_3 = 1.3$ α~0.8
124* 0.277 K : L : M = 100 : 19 : 4.7
$\alpha_K = 0.29$ *3*
1.4* 0.407 K/LM = 2.3 $\alpha_K \geq 1.5$
(ce 0.130 γ)(0.277 γ) sl, scin
(0.277 γ)(0.407 γ) ≥ 500 scin
*Relative ce intensities

R. Joly, J. Brunner, J. Halter, O. Huber, Helv. Phys. Acta 28, 403 (1955); 26, 591A (1953).

γ (0.279) E2/M1 = 0.12 *3* γγ(θ)
or 2.0 *3*
(0.130 γ)(0.279 γ)(θ) J = 11/2, 5/2, 3/2

J. V. Kane, S. Frankel, Bull. Am. Phys. Soc. 1, No. 4, 171 E9 (1956).

Au^{197} 79 118 — Levels — $Au^{197}(\alpha,\alpha'\gamma)$ — $E_\alpha = 3.25$

0.077 level B(E2) = 0.18* sπ ce
γ 0.077
0.268 level B(E2) 0.13*
γ 0.191
0.279 level
γ 0.279 K/L = 5.5
*Used B(E2) = 0.334 for 0.279 level

E. M. Bernstein, H. W. Lewis, Phys. Rev. 100, 1345; 99, 617A (1955).

γ $Au^{197}(p,p'\gamma)$ $E_p = 3.8$
7.9* 0.1913 *8* K/L = 4.2 sπ ce
1.9* 0.2698 *11* K/L = 6
18.3* 0.2795 *11* K : L : MN = 20 : 3.1 : 1
0.5* 0.5477 *20* K/L = 3.6
*σ(90°) for ce_K in μb/sterad

M. S. Moore, C. M. Class, F. W. Prosser, Jr., J. P. Schiffer, Bull. Am. Phys. Soc. 1, No. 2, 88, H2 (1956).

γ $Au^{197}(n,n'\gamma)$ E_n = 0.35 to 3.9
0.20 scin
0.28
0.50

R. B. Day, A. E. Johnsrud, D. A. Lind, Bull. Am. Phys. Soc. 1, No. 1, 56, R9 (1956).

Au^{198} 79 119 2.7^d

$\gamma(Hg^{198})$ 0.4118 *3* $\alpha_K = 0.029$ EA
$\alpha_L = 0.011$
$L_1 : L_2 : L_3 = 19 \pm 3 : 22 \pm 3 : 10$

D. R. Connors, W. C. Miller, B. Waldman, Phys. Rev. 100, 1237A (1955); verbal report.

Au^{198}
79 119
2.7^d

$\gamma(Hg^{198})$ (0.411) $L_1L_2/L_3 = 5.9$ s
K : L : M : N = 100 : 36 : 10 : 2.7

R. D. Birkhoff, W. W. Smith, H. H. Hubell, Jr., J. S. Cheka, Rev. Sci. Instr. 26, 959 (1955).

Au^{198}
79 119

Capture γ Au^{197}(th n,γ)
0.248 *13* scin Cp
Study covered $E_\gamma = 0.1$ to 2.5

M. Reier, M. H. Shamos, Phys. Rev. 100, 1302 (1955); 95, 636A (1954).

Capture γ's Au^{197}(n,γ) cryst

0.261		0.328	
0.271		0.343	double
0.276		0.350	
0.291	double	0.354	
0.308		0.370	double
0.311		0.381	
0.316		0.439	

Study covered $E_\gamma = 0.260$ to 0.440

D. Rose, B. Hamermesh, Bull. Am. Phys. Soc. 1, No. 4, 189 K13 (1956); verbal report.

Hg^{192}
80 112
5.7^h

τ 6.3^h Bi^{209}(480-Mev p) chem

A. P. Vinogradov, I. P. Alimarin, V. I. Baranov, A. K. Lavrukhina, T. V. Baranova, F. I. Pavlotskaya, Conf. Acad. Sci. on Peaceful Use of Atomic Energy, Chem. Sci. p. 132 July (1955); Consultants Bureau Trans. p. 85.

Hg^{193}
80 113
12^h

τ 11^h Bi^{209}(480-Mev p) chem

A. P. Vinogradov, I. P. Alimarin, V. I. Baranov, A. K. Lavrukhina, T. V. Baranova, F. I. Pavlotskaya, Conf. Acad. Sci. on Peaceful Use of Atomic Energy, Chem. Sci. p. 132 July (1955); Consultants Bureau Trans. p. 85.

Hg^{193}
80 113
$12^h + 4^h$

$\gamma(Au^{193})$ sπ, sl ce

(0.032)	0.360	
(0.038)	0.364	
0.157	0.3812	0.920
(0.186)	0.382	1.120
(0.218)	0.394	1.170
0.220	0.407	1.240
(0.258)	0.499	1.320
(0.291)	0.534	1.490
0.300	0.571	1.630
0.345	0.860	

(0.218 γ)($\sim$0.40 γ) (0.038 γ)(0.220 γ)

J. Brunner, H. Guhl, J. Halter, H. J. Leisi, Helv. Phys. Acta 28, 475A (1955).

Hg^{194}
80 114
$\sim 130^d$
g.s.

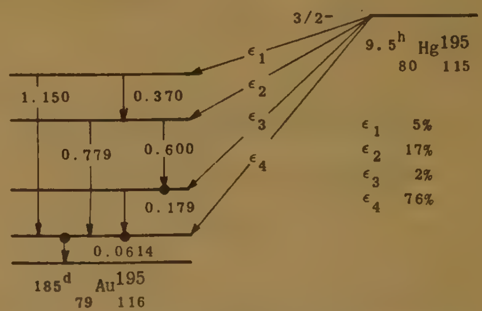
τ $\sim 130^d$ Au^{197}(55-Mev p,4n) chem
No γ sl ce, scin
γ's observed assigned to 39^hAu

J. Brunner, H. Guhl, J. Halter, H. J. Leisi, Helv. Phys. Acta 28, 475A (1955).

Hg^{195}
80 115
9.5^h
g.s.

τ 9.5^h *5* Au^{197}(27-Mev d,4n) chem

$\gamma(Au^{195})$ **0.0614** L/M = 3.5 sπ, sl ce
$L_1 : L_2 : L_3 = 1.1 : 1 : 1$
$\alpha \sim \infty$
0.179 $\alpha_K = 0.85$ *15*
4.5+ **0.390** *20*
31+ **0.600** $\alpha_K \sim 0.02$
0.779 $\alpha_K = 0.013$ K/LM = 4.5
0.930 *50*
22+ **1.150**
(ce_L 0.061 γ)(K x ray, 0.179, 0.60, 0.779, 1.150 γ)
(ce_K 0.179 γ)(K x ray, 0.390, 0.60, 0.930 γ)



R. Joly, J. Brunner, J. Halter, O. Huber, Helv. Phys. Acta 28, 403 (1955); 26, 591A (1953); 27, 512A, 572 (1954).

Hg^{195}
80 115
$40^h + 9.5^h$

$\gamma(Au^{195})$ sπ, sl ce

0.172	
0.2005	0.810
0.207	0.920
0.368	0.955
0.388	1.010
0.439	1.120
0.525	1.180
0.584	1.255

(0.388 γ)(0.368 γ)(0.207 γ) (0.179 γ)(0.920 γ)
(ce 0.262 γ)/(ce 0.2005 γ)$\sim$100
Only new γ's are listed; source: $40^h + 9.5^h$ Hg

J. Brunner, H. Guhl, J. Halter, H. J. Leisi, Helv. Phys. Acta 28, 475A (1955).

Hg^{195}
80 115
40^h

τ 40.0^h *5* Au^{197}(27-Mev d,4n) chem

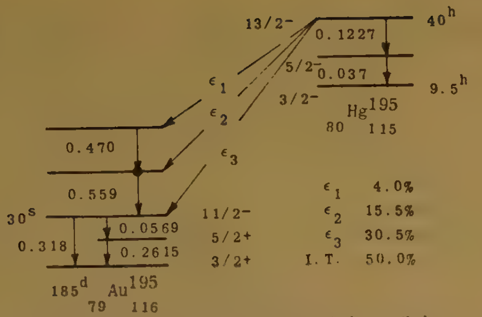
$\gamma(Hg^{195})$ **0.037** $L_1/L_2 \sim 10$ sπ, sl ce
L : M : N = 60 : 20 : 11
$\alpha \sim \infty$
0.1227 $L_1 : L_2 : L_3 = 10 : 3 : 19$
K : L : MN = 11 : 50 : 23
$\alpha \geq 24$

$\gamma(Au^{195})$ scin, sl ce
34+ **0.470** *5*
229+ **0.559** K : L : M = 50 : 9.3 : 2.3
14+ $\sim$**1.03** scin

(ce_K 0.559 γ)(K x ray, 0.470 γ)

Continued

Hg^{195}
80 115
40^h



R. Joly, J. Brunner, J. Halter, O. Huber, Helv. Phys. Acta 28, 403 (1955); 26, 591A (1953); 27, 512A, 572 (1954).

Hg^{197}
80 117
65^h
g.s.

$\gamma(Au^{197})$ Au^{197}(27-Mev d, 2n) chem

1060*	0.0776	$\alpha \sim 2.3$	$s\pi$, sl ce
		$L_1 : L_2 : L_3 = 100 : 46 : 34$	
		L : M : N = 831 : 176 : 53	
8.62*	0.1918	$\alpha_K = 0.90$ *10*	
		K : L : M = 7.2 : 1.1 : 0.34	

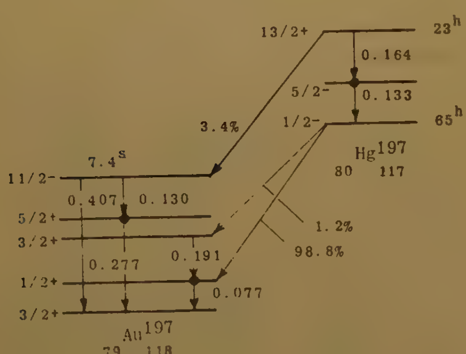
(ce 0.077γ)(K x ray, ce 0.191γ, 0.191γ)
*Relative ce intensities

R. Joly, J. Brunner, J. Halter, O. Huber, Helv. Phys. Acta 28, 403 (1955); 26, 591A (1953).

Hg^{197}
80 117
23^h

γ (0.133) E2 = 100% $ce_K\gamma(\theta)$
(0.164) E5/M4 ≤ 0.09
(ce_K 0.164 γ)(0.133 γ)(θ) J = 13/2, 5/2, 1/2
Magnetic attenuation of correlation coefficients due to electron rearrangement shown

F. Gimmi, E. Heer, P. Scherrer, Helv. Phys. Acta 28, 470A (1955).



R. Joly, J. Brunner, J. Halter, O. Huber, Helv. Phys. Acta 28, 403 (1955); 26, 591A (1953).

Hg^{198}
80 118

Level $Hg^{(198)}(p,p'\gamma)$ $E_p = 3.2$; scin
γ (0.411) τ = $60^{\mu\mu s}$ (α = 0.04)

R. H. Davis, A. S. Divatia, R. D. Moffat, D. A. Lind, Phys. Rev. 100, 1266A (1955); verbal report.

Hg^{199}
80 119

Levels $Hg^{(199)}(p,p'\gamma)$ $E_p = 3.2$; scin
γ 0.159 *4* B(E2) = 0.17 (α = 1.0)
0.209 *5* B(E2) = 0.06 (α = 0.7)

R. H. Davis, A. S. Divatia, R. D. Moffat, D. A. Lind, Phys. Rev. 100, 1266A (1955); verbal report.

Levels $Hg^{(199)}(n,n'\gamma)44^mHg^{199}$
0.61 E_n = 0.5 to 2
0.98
1.28
1.84
These levels feed IT state

C. P. Swann, F. R. Metzger, Phys. Rev. 100, 1329 (1955).

Hg^{200}
80 120

Level $Hg^{(200)}(p,p'\gamma)$ $E_p = 3.2$; scin
γ 0.375 *7* τ = $83^{\mu\mu s}$ (α = 0.05)

R. H. Davis, A. S. Divatia, R. D. Moffat, D. A. Lind, Phys. Rev. 100, 1266A (1955); verbal report.

Capture γ's $Hg^{(199)}$(th n,γ) $s\pi$ Cp

20†	0.37 *1*	> 3†	3.14 *3*
~ 3†	0.58 *2*	> 3†	3.25 *3*
6†	0.68 *1.5*	> 0.5†	3.50 *5*
~ 2†	0.83 *2*	> 0.5†	3.60 *5*
~ 7†	0.90 *3*	> 1†	3.80 *5*
~ 3†	1.01 *2*	> 1†	4.12 *5*
~ 2†	1.10 *2*	3.5†	~4.59 *5*
> 6†	1.22 *1.5*	6†	4.69 *5*
> 7†	1.29 *1*	10†	4.82 *3*
	1.41 *2*	3†	4.94 *5*
	~1.49 *2*	6†	5.05 *3*
> 4†	1.59 *2*	1.4†	~5.28 *5*
	~1.62 *2*	4.5†	5.44 *3*
> 13†	1.73 *1*	6.7†	5.67 *3*
	1.85 *2*	2†	~5.88 *5*
> 6†	2.02 *1.5*	10†	5.99 *3*
	2.10 *3*	2.4†	6.31 *5*
> 4†	2.29 *3*	4.5†	6.44 *3*
	2.40 *3*	0.03†	6.95 *5*
> 3†	2.64 *3*	0.03†	~7.08 *5*
> 1†	2.89 *3*	0.1†	7.66 *3*

†Photons/100 n's captures
Levels proposed at 0.37, 0.95, 1.10, 1.59, 1.73, 2.02, 2.10, 2.40, 2.59, 2.75, 3.00, 3.12, 3.25, 3.34, 3.44, 3.91 Level scheme implies B_n = 8.03 *3*

B. P. Adyasevich, B. D. Groshev, A. M. Demidov, Conf. Acad. Sci. USSR on Peaceful Use of Atomic Energy, Phys. Math. Sci. p. 270 July (1955); Consultants Bureau Trans. p. 195.

Hg^{202}
80 122

Level $Hg^{(202)}(p,p'\gamma)$ $E_p = 3.2$; scin
γ (0.439) τ = $45^{\mu\mu s}$ (α = 0.03)

R. H. Davis, A. S. Divatia, R. D. Moffat, D. A. Lind, Phys. Rev. 100, 1266A (1955); verbal report.

Tl ? 81 — γ — Tl(γ, ?γ) — $E_\gamma \le 19.5$ scin

0.410 *15* }
0.706 *20* } $\tau = 65^{\mu s}$ *5*
0.506 *15* $\tau = 530^{\mu s}$ *50*

S.H.Vegors, Jr., P.Axel, Phys. Rev. 100, 1238A (1955); verbal report.

Tl 81 — γ — Tl(n, n′γ) — E_n = 0.35 to 3.9 scin

0.20	0.44
0.28	0.62
0.40	0.70

R.B.Day, A.E.Johnsrud, D.A.Lind, Bull. Am. Phys. Soc. 1, No. 1, 56, R9 (1956).

Tl^{195} 81 114, 1.2^h

τ 1.2^h *1* Hg^{196}(20-Mev d,3n) chem
p $9.5^h Hg^{195}$ chem; not p $40^h Hg^{195}$ chem (< 20%)

J.D.Knight, E.W.Baker, Phys. Rev. 100, 1334; 99, 1646A (1955).

Tl^{197} 81 116, 2.8^h, g.s.

τ 2.8^h *2* Au^{197}(39-Mev α,4n) chem
$\gamma(Hg^{197})$ 0.1526 *5* sπ ce
p $65^h Hg^{197}$ chem; not p $23^h Hg^{197}$ (< 5%) chem

J.D.Knight, E.W.Baker, Phys. Rev. 100, 1334; 99, 1646A (1955).

Tl^{198} 81 117, 5.3^h, g.s.

$\gamma(Hg^{198})$ Au^{197}(34-Mev α,3n) chem

0.194 sπ ce
0.2267
0.283
(0.411)
0.675
~1.075 scin
~1.23
~1.44

Unassigned ce: 0.132, 0.512, 0.715, 0.924

J.D.Knight, E.W.Baker, Phys. Rev. 100, 1334; 99, 1646A (1955).

Tl^{198} 81 117, 1.8^h

$\gamma(Tl^{198})$ Au^{197}(34-Mev α,3n) chem
100* (0.2607) sπ ce
(0.2824)

$\gamma(Hg^{198})$	0.194 ?	K/LM
~2*	0.442	~8
~3*	0.586	~8
~6*	0.635	~6

$0.635\gamma/0.282\gamma \sim 1.1$; $0.586\gamma/0.282\gamma \sim 1.1$ scin
Unassigned ce: 0.221, 0.292, 0.308, 0.339, 0.415, 0.436, 0.458, 0.467, 0.585, 0.642, 0.753, 0.816
*Relative ce_K intensities

J.D.Knight, E.W.Baker, Phys. Rev. 100, 1334; 99, 1646A (1955).

Tl^{204} 81 123

E_ϵ 0.376 (K x ray)(continuum γ)
From γ continuum endpoint = 0.293 *20*

R.G.Jung, M.L.Pool, Bull. Am. Phys. Soc. 1, No. 4, 172 E11 (1956).

Tl^{208} 81 127, 3.1^m

$\gamma(Pb^{208})$ (0.511) E2/M1 = 0.04 $\gamma\gamma(\theta, \hookrightarrow)$
(0.583) E2
(0.860) E2/M1 ~ 0.0008
(2.615) E3

(0.511 γ)(0.583 γ)(θ, $\hookrightarrow$) $J = 5^-, 5^-, 3^-$
(0.583 γ)(2.615 γ)(θ, $\hookrightarrow$) $J = 5^-, 3^-, 0^+$
(0.860 γ)(2.615 γ)(θ, $\hookrightarrow$) $J = 4^-, 3^-, 0^+$

G.T.Wood, P.S.Jastram, Phys. Rev. 100, 1237A (1955).

Pb^{204} 82 122, 68^m

(0.375) E2 100%
(0.899) E2 100%
(0.912) E5 100%

(0.375 γ)(0.899 γ)(θ) J = 4, 2, 0
(0.912 γ)(0.375 γ)(θ) }
(0.912 γ)(0.899 γ)(θ) } J = 9, 4, 2, 0

J.R.Huizenga, V.E.Krohn, S.Raboy, Bull. Am. Phys. Soc. 1, No. 1, 43, K10 (1956).

Pb^{206} 82 124

Levels Pb^{206}(n, n′) E_n = 2.45 pulsed n's

51† 0.80
44† 1.44
32† 1.74

†$\sigma(90°)$ in mb/sterad

L.Cranberg, J.S.Levin, Bull. Am. Phys. Soc. 1, No. 1, 56, R10 (1956); verbal report.

γ Pb^{206}(n, n′γ) E_n = 0.35 to 3.9 scin

	E_γ	Thresh
30†	0.535 *5*	1.38 *3*
17†	0.662 *5*	1.475 *30*
50†	0.803	0.78 *3*
	1.36 *5*	2.250 *15*
	1.45 *5*	1.55 *10*
10†	1.68 *3*	1.75 *10*

†$\sigma(90°)$ at E_n = 2.59 in mb/sterad

R.B.Day, A.E.Johnsrud, D.A.Lind, Bull. Am. Phys. Soc. 1, No. 1, 56, R9 (1956); verbal report.

Pb^{207} 82 125

Capture γ $Pb^{(206)}$(th n, γ) sπ Cp
6.74 *3*

B.P.Adyasevich, B.D.Groshev, A.M.Demidov, Conf. Acad. Sci. USSR on Peaceful Use of Atomic Energy, Phys. Math. Sci. p. 270 July (1955); Consultants Bureau Trans. p. 195.

Pb^{208} 82 126 — Capture γ — $Pb^{207}(\text{th } n, \gamma)$ — sπ Cp
7.40 *3*
No other γ (< 10% of 7.40 γ)

B.P. Adyasevich, B.D. Groshev, A.M. Demidov, Conf. Acad. Sci. USSR on Peaceful Use of Atomic Energy, Phys. Math. Sci. p. 270 July (1955); Consultants Bureau Trans. p. 195.

Pb^{212} 82 130 11^h — $\gamma(Bi^{212})$ (0.238) K/L = 5.5 *2* sd ce
(ce_K 0.238 γ)/100 β's = 30 ±2

O.B. Nielsen, Kgl. Danske Videnskab. Selskab Mat.-fys. Medd. 30, No. 11 (1955).

$\gamma(Bi^{212})$

	L_1	L_2	L_3	M_1	M_2
(0.238)	1000:	108 :	8 :	240 :	28

s ce

V.M. Kel'man, V.A. Romanov, R.Ja. Metshvapichichirli Doklady Akad. Nauk. SSSR 103, 577 (1955).

$\gamma(Bi^{212})$ (0.238) K/L = 5.9 *4* sd ce
L_1/L_2 = 10.0 *7*

E. Sokolowski, K. Edvarson, K. Siegbahn, Nuclear Phys. 1, 160 (1956).

Bi^{202} 83 119 — τ_1 30^m; τ_2 1.5^h — U(480 - Mev p) chem

A.P. Vinogradov, I.P. Alimarin, V.I. Baranov, A.K. Lavrukhina, T.V. Baranova, F.I. Pavlotskaya, A.A. Bragina, Y.V. Yakovlev, Conf. Acad. Sci. on Peaceful Use of Atomic Energy, Chem. Sci. p. 97 July (1955); Consultants Bureau Trans. p. 65.

Bi^{205} 83 122 14.5^d — τ 15^d — U(480 - Mev p) chem

A.P. Vinogradov, I.P. Alimarin, V.I. Baranov, A.K. Lavrukhina, T.V. Baranova, F.I. Pavlotskaya, A.A. Bragina, Y.V. Yakovlev, Conf. Acad. Sci. on Peaceful Use of Atomic Energy, Chem. Sci. p. 97 July (1955); Consultants Bureau Trans. p. 65. p. 65.

Bi^{207} 83 124 8.0^y — $\gamma(Pb^{207})$ 0.56885 *30* sl pe
1.06343 *50*
No other γ with E_γ = 1.06 *8* (< 10% of 1.063 γ)

A.I. Yavin, F.H. Schmidt, Phys. Rev. 100, 171 (1955).

Bi^{208} 83 125 — γ — $Bi^{209}(\gamma, n\gamma)$ — $E_\gamma \leq 19.5$ scin
0.500 *20*, 0.930 *30* } $\tau = 2.70^{ms}$ *25*

S.H. Vegors, Jr., P. Axel, Phys. Rev. 100, 1238A (1955); verbal report.

Bi^{209} 83 126 — Levels — $Bi^{209}(n,n')$ — E_n = 4.3; scin pulsed n's, 90°
0.9 ?
1.8

R.V. Smith, Bull. Am. Phys. Soc. 1, No. 4, 175 F2 (1956); verbal report.

Bi^{210} 83 127 5.0^d — p 4.2$^m Tl^{206}$ 0.00017 *2* % chem

R.W. Fink, G.W. Warren, B.L. Robinson, R.R. Edwards, Bull. Am. Phys. Soc. 1, No. 4, 171 E5 (1956).

Bi^{210} 83 127 — Resonances — $Bi^{209}(n)$ — E_n = 2 to 20000 ev chopper

E_o(kev)	Γ(ev)
0.810	5.8 *3*
2.37	17 *2*
13	double

L.M. Bollinger, D.A. Dahlberg, R.R. Palmer, G.E. Thomas, Phys. Rev. 100, 126 (1955); 95, 645A (1954).

Bi^{212} 83 129 60.5^m — $\gamma(Tl^{208})$ — $11^h Pb^{212}$ source

113*	(0.287)	K/L = 5.3	sd; α(ce)
27*	(0.327)		
4.0*	(0.431)		
34*	(0.451)	K/L = 5	
2.5*	(0.471)		

α(ce 0.287, 0.327, 0.431, 0.451, 0.471 γ)
*ce_K per 10^5 disintegrations

O.B. Nielsen, Kgl. Danske Videnskab. Selskab Mat-fys. Medd. 30, No. 11 (1955).

$\gamma(Tl^{208})$ (0.040) α_L = 21 *7* scin
(6.05 α)(0.040γ)(θ) J = $1^-, 4^+, 5^+$ *
*From $\eta(\pi)$ = 0.299 *42*; E2/M1 ≤ 5 x 10^{-5} for 0.04γ
$J(Bi^{212}) = 1^-$; $J(Tl^{208}) \neq 6$

J.W. Horton, Phys. Rev. 101, 717 (1956); 90, 388A (1953).

(6.05 α)(0.040 γ) delay > $0.1^{\mu\mu s}$
No Doppler broadening observed sl $\alpha(ce_{L1})$

J. Brude, S.G. Cohen, Phys. Rev. 101, 495 (1956).

Bi^{214} 83 131 20^m — β^- a

~20%	~0.45	7%	1.72 *9*
22%	1.03 *12*	6%	2.57 *12*
29%	1.45 *4*	13%	3.18 *9*

(1.45, 2.57 β) γ No (3.18 β) γ

R.A. Ricci, G. Trivero, Nuovo Cim. 2, 745 (1955).

Po^{206} 84 122 9^d

$\epsilon/\alpha = 95/5$ $(Rn^{210}\ \alpha)/(Po^{206}\ \alpha)$ ic

F.F.Momyer, Jr., E.K.Hyde, J. Inorg. Nucl. Chem. 1, 274 (1955).

Po^{208} 84 124 2.9^y

$\gamma(Bi^{208})$ $Bi^{209}(d,3n)$ chem
$3^\dagger$ **0.285** scin
$6^\dagger$ **~0.60** double
(K x ray) (0.285, ~0.60 γ)
(0.285 γ) (both 0.60 γ's)
Source ~99% Po^{208} from $(Po^{208}\ \alpha)/Po^{209}\ \alpha)$
†Photons per 10^5 α's

I. Perlman, F. Asaro, F.S. Stephens, J.P. Hummel, R.C. Pilger, UCRL-2932, p 59 (1955); priv. comm.

Po^{209} 84 125

ground state
J 1/2 S

K.L.Vander Sluis, P.M.Griffin, J. Opt. Soc. Am. 45, 1087 (1955).

Po^{209} 84 125 $\sim 200^y$

$\gamma(Pb^{205})$ $Bi^{209}(d,2n)$ chem
40† **0.260** $\alpha_K = 0.75$ scin
$\gamma(Bi^{209})$
50† **0.910** $\alpha_K = 0.021$
α(0.260 γ) (K x ray)(0.910 γ)
$\epsilon_{LM}/\epsilon_K \sim 0.2$
All ϵ to 0.910 level of Bi^{209} x γ/x
Source 85% Po^{209} from $(Po^{209}\alpha)/(Po^{208}\ \alpha)$
†Photons per 10^4 α's

I.Perlman, F.Asaro, F.S.Stephens, J.P.Hummel, R.C.Pilger, UCRL-2932, p 59 (1955); priv. comm.

$Po^{208,9}$

γ(?) ~70† **0.270** Bi^{209}(20-Mev p)
~70† **0.570** scin
75† **0.865**
(0.270 γ)(0.570 γ)
0.865 γ is not crossover Σ scin
Source 14.5% Po^{209}(band spectrum measurement)
†Photons per 10^4 α's

E.H.Daggett, G.R.Grove, Phys. Rev. 99, 1 (1955); 95, 627A (1954).

Rn^{208} 86 122 23^m

τ 23^m *2* Th^{232}(340-Mev p) chem
ϵ ~80% $(Po^{208}\ \alpha)/(Rn^{208}\ \alpha)$ ic
α ~20% **6.14** *2* ic
p $3.8^h Po^{204}$ (5.37α observed)

F.F.Momyer, Jr., E.K.Hyde, J. Inorg. Nucl. Chem. 1, 274 (1955).

α **6.141** *4* s

F.F.Momyer, Jr., F.Asaro, E.K.Hyde, J. Inorg. Nucl. Chem. 1, 267 (1955).

Rn^{209} 86 123 30^m

τ 30^m *2* Th^{232}(340-Mev p) chem
ϵ 83% $(At^{209}\ \alpha^*)/(Rn^{209}\ \alpha)$ ic
α 17% **6.02** *2* ic
p $5.5^h At^{209}$ (5.65α observed)
*Used $\epsilon(At^{209})/\alpha(At^{209}) = 95/5$

F.F.Momyer, Jr., E.K.Hyde, J. Inorg. Nucl. Chem. 1,274 (1955); Phys. Rev. 86, 805 (1952).

α **6.037** *10* s

F.F.Momyer, Jr., F.Asaro, E.K.Hyde, J. Inorg. Nucl. Chem. 1, 267 (1955).

Rn^{210} 86 124 2.7^h

τ 2.7^h *2* Th^{232}(340-Mev p) chem
ϵ ~4% $(Po^{210}\ \alpha)/(Rn^{210}\ \alpha)$ ic
α ~96% **6.02** *2* ic
p $9^d Po^{206}$ (5.22α observed)

F.F.Momyer, Jr., E.K.Hyde, J. Inorg. Nucl. Chem. 1, 274 (1955); Phys. Rev. 86, 805 (1952).

α **6.037** *3* s

F.F.Momyer, Jr., F.Asaro, E.K.Hyde, J. Inorg. Nucl. Chem. 1, 267 (1955).

Rn^{211} 86 125 16^h

τ 16^h *1* Th^{232}(340-Mev p) chem
ϵ 74% $(Po^{211}\alpha)/(Rn^{211}\alpha + At^{211}\alpha^\S)$ ic
$\gamma(At^{211})^*$ **0.030** scin
0.246 **0.97**
0.430 **1.13**
0.890 **1.34**
α 26% **5.82** *2* ic
p $7.5^h At^{211}$ chem
§Used $\epsilon(At^{211})/\alpha(At^{211}) = 60/40$

F.F.Momyer, Jr., E.K.Hyde, J. Inorg. Nucl. Chem. 1, 274 (1955); Phys. Rev. 86, 805 (1952); *B.Raby, A.W.Stoner, ibid.

α 2.0† 5.613 *7* Th^{232}(340-Mev p) chem; s
64.5† 5.779 *3*
32.5† 5.847 2
$\gamma(Po^{207})$ **0.0688**§ s π ce
0.169* scin $\alpha\gamma$
0.234* scin $\alpha\gamma$
α(0.069, 0.169, 0.234 γ)*

F.F.Momyer, Jr., F.Asaro, E.K.Hyde, J. Inorg. Nucl. Chem. 1, 267 (1955); *A.W.Stoner, F. Asaro, ibid.; §A.W.Stoner, A.C.Smith, J.M. Hollander, ibid.

Rn^{212} 86 126 23^m

α **6.262** *5* s

F.F.Momyer, Jr., F.Asaro, E.K.Hyde, J. Inorg. Nucl. Chem. 1, 267 (1955).

Rn^{220} 86 134 52^s — τ 51.5^s *10* d Th^{232} chem

H. Schmied, R. W. Fink, B. L. Robinson, J. Inorg. Nucl. Chem. 1, 342 (1955).

Fr^{211} 87 124 — τ Not 2^m to 5^{m*} Th^{232}(340-Mev p) chem

No Rn daughter observed

F. F. Momyer, Jr., E. K. Hyde, J. Inorg. Nucl. Chem. 1, 274 (1955); *Phys. Rev. 86, 805 (1952).

Fr^{212} 87 125 19^m — Th^{232}(340-Mev p) chem

α	24†	6.342 *7*	s
	39†	6.387 *9*	
	37†	6.411 *9*	

F. F. Momyer, Jr., F. Asaro, E. K. Hyde, J. Inorg. Nucl. Chem. 1, 267 (1955).

Ra^{213} 88 125 2.7^m — τ 2.7^m *3* Th^{232}(340-Mev p) chem

α 6.90 *4* ic

p $30^m Rn^{209}$ (6.02 α observed)

F. F. Momyer, Jr., E. K. Hyde, J. Inorg. Nucl. Chem. 1, 274 (1955).

Ac^{226} 89 137 29^h — $\gamma(Th^{226})$ 0.159 scin

0.232

F. S. Stephens, Jr., F. Asaro, I. Perlman, Phys. Rev. 100, 1543 (1955); J. R. Grover, G. T. Seaborg, ibid.

Ac^{227} 89 138 22^y — β^- 0.0455 *10* pc

F-K linear ($E_\beta > 0.007$)

No 0.037 γ, no ce, no Th L x ray 4π pc

0.0167 *5* and 0.020 *1* γ's observed but growth suggests assignment to impurity

W. Beckmann, Z. Phys. 142, 585 (1955). Z. Naturf. 10a 86 (1955).

Th^{230} 90 140 8×10^{4y} — $\gamma(Ra^{226})$

590†	0.068		scin
7†	0.142		
14†	0.184	E1	
17†	0.253	E1	

E1 assignment from systematics

†Photons per 10^5 α's

F. S. Stephens, Jr., F. Asaro, I. Perlman, Phys. Rev. 100, 1543 (1955).

Th^{231} 90 141 26^h — β^- 0.305 *10*

$\gamma(Pa^{231})$ 0.0255 $s\pi$ ce, pc, scin

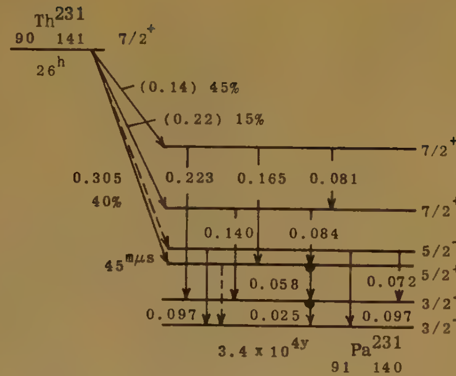
0.0255	
0.0585	0.0974
0.0719	0.140
0.0812	0.1652
0.0841	0.223

(0.305 β)(0.084 γ) delay = $45^{m\mu s}$ *3*

($\sim$0.08 γ)(0.0255, 0.0585 γ)

Continued

Th^{231} 90 141 26^h



J. P. Mize, J. W. Starner, Bull. Am. Phys. Soc. 1, No. 4, 171 E6 (1956); verbal report.

Th^{232} 90 142 1.4×10^{10y} — $\gamma(Ra^{228})$ 0.059 *1* L/M$\sim$3 ppl α(ce)

ce/α = 0.24 *3*

S. W. Peat, M. A. S. Ross, Proc. Phys. Soc. 68A, 923 (1955).

τ for spontaneous fission $> 10^{20y}$ ic

From 0.002 fissions per hr gm of sample. However half of these counts are due to presence of 0.006% U

A. V. Podgurskaya, V. I. Kalashnikova, G. A. Stolyarov, E. D. Vorob'ev, G. N. Flerov, Zhur. Eksptl' i Teoret. Fiz. 28, 503 (1955); AERE Lib/Trans. 569.

τ for spontaneous fission = 1.4×10^{18y}

From 0.15 fissions per hr gm of sample. Less than 0.1 of these counts are due to U

E. Segrè, Phys. Rev. 86, 21 (1952).

Th^{232} 90 142 — Level $Th^{232}(\alpha,\alpha'\gamma)$ $E_\alpha = 3.3$; scin

γ 0.050 *5* $\tau = 780^{\mu\mu s}$ (α = 340)

A. S. Divatia, R. H. Davis, R. D. Moffat, D. A. Lind, Phys. Rev. 100, 1266A (1955); verbal report.

γ $Th^{232}(p,p'\gamma)$ $E_p = 4.8$

1.1^* 0.719 K/L = 3.5 $s\pi$ ce

*$\sigma(90°)$ for ce_K in μb/sterad

M. S. Moore, C. M. Class, F. W. Prosser, Jr., J. P. Schiffer, Bull. Am. Phys. Soc. 1, No. 2, 88, H2 (1956).

Th^{234} 90 144 24^d — β^- 35% 0.100 *2* $s\pi$ $\beta\gamma$

65% (0.191)

(0.100 β)(0.090 γ)

E. F. deHaan, G. J. Sizoo, P. Kramer, Physica 21, 803 (1955); 19, 1201 (1953).

Pa^{231} 91 140 3.4×10^{4}y

α — sd

1.3%	**4.6710** *50*
0.8%	**4.7040** *80* ?
10%	**4.7270** *50*
1.5%	**4.8476** *50*
24%	**4.9420** *70*
1.5%	**4.9740** *60*
26%	**5.0060** *70*
23%	**5.0205** *45*
12%	**5.0490** *30*

No α with $4.7270 \leq E_{\alpha} \leq 4.8476$ (< 0.1%)

L.L.Gol'din, E.F.Tret'yakov, G.I.Novikova, Conf. Acad. Sci. USSR on Peaceful Use of Atomic Energy, Phys. Math. Sci. p. 226 July (1955); UCRL Trans. 242.

Pa^{234} 91 143 1.2^{m}

β^- **0.60** Th^{234} source; $s\pi$ $\beta\gamma$
1.50

$\gamma(U^{234})$ **(0.80)** $\alpha_K = 0.15^*$ M2

*Assuming proposed decay scheme

E.F.deHaan, G.J.Sizoo, P.Kramer, Physica 21, 803 (1955).

U^{233} 92 141

ground state — S

J 5/2

$\mu(U^{233})/\mu(U^{235}) = -1.8$ *1*

$q(U^{233})/q(U^{235}) = +2.0$ *3*

N.I.Kaliteevskii, M.P.Chaika, Doklady Akad. Nauk SSSR 103, 49 (1955).

ground state — S

J 5/2

$\mu(U^{233})/\mu(U^{235}) \sim -1.5^*$

*From comparison with published data on same line in U^{235} spectrum

L.A.Korostyleva, A.R.Striganov, N.M.Iashin, Zhur. Eksptl' i Teoret. Fiz. 28, 471 (1955); Soviet Phys. JETP 1, 310 (1955); Izvest. Akad. Nauk. Ser. Fiz. SSSR 19, 31 (1955).

U^{233} 92 141 1.6×10^{5}y

α — sd

0.03%	**4.489** *5*
1.6%	**4.7174** *10*
14.9%	**4.7732** *4*
83.5%	**4.8157** *5*

L.L.Gol'din, E.F.Tret'yakov, G.I.Novikova, Conf. Acad. Sci. USSR on Peaceful Use of Atomic Energy, Phys. Math. Sci. p. 226 July (1955); UCRL Trans. 242.

α's emitted preferentially in the direction perpendicular to nuclear axis $\alpha(\theta,T)$

$W(\theta) = 1 - 0.06P_2(\cos\theta)$ at 1.1°K

J.W.T.Dabbs, L.D.Roberts, G.W.Parker, Bull. Am. Phys. Soc. 1, No. 4, 207 R9 (1956).

U^{234} 92 142 2.5×10^{5}y

α — sd

28%	**4.7168** *10*
72%	**4.7683** *10*

L.L.Gol'din, E.F.Tret'yakov, G.I.Novikova, Conf. Acad. Sci. USSR on Peaceful Use of Atomic Energy, Phys. Math. Sci. p. 226 July (1955); UCRL Trans. 242.

U^{234} 92 142

Resonances $U^{233}(n)$ — cryst

σ_{to}	E_o(ev)	Γ(mev)	Γ_f(mev)
975	**1.785**	300	270
1020	**2.290**	100	70
233	**3.635**	198	168
1015	**6.795**	187	157
680	**10.375**	294	264

V.L.Sailor, Phys. Rev. 100, 1249A (1955); verbal report.

Resonances $U^{233}(n,f)$ $E_n = 10^{-3}$ to 10^{3} ev — cryst

1.80 *2* ev	**5.1**
2.30 *2*	**7**
3.5	**12**

J.M.Auclair, M.Galula, P.Hubert, B.Jacrot, R.Joly, F.Netter, G.Vendryes, Geneva Conf. 8/P/354 (1955).

U^{235} 92 143

ground state — S

J 5/2 (7/2?)

$\mu(U^{233})/\mu(U^{235}) = -1.8$ *1*

$q(U^{233})/q(U^{235}) = +2.0$ *3*

N.I.Kaliteevskii, M.P.Chaika, Dokoady Akad. Nauk SSSR 103, 49 (1955).

U^{235} 92 143 7.1×10^{8}y

$(4.40\ \alpha)(0.188\ \gamma)$ — scin

P.Huber, K.P.Meyer, E.Würger, Helv. Phys. Acta 28, 326A (1955).

$\gamma(Th^{231})$ — enriched U^{235} scin

~13†	**0.146** *3*
55†	**0.188** *2*
3.7†	**0.209** *4* ?
0.03†	**0.349** *4* ?

No other γ with $0.26 < E_{\gamma} < 0.45$ (< 0.01†)

†Photons per 100 α's

C.W.Malich, Bull. Am. Phys. Soc. 1, No. 1, 43 K12 (1956).

U^{236} 92 144

Resonances $U^{235}(n,f)$ $E_n = 0.005$ to 150 ev — cryst, chopper

E_o(ev)	Peak σ_f^*
-0.01 to 0.01	
1.12	85
3.55	98
6.3	130
7.0	89
8.7	840
12.2	450
19.5	640
33.5	960

*Assuming $\Gamma = 0.15$ ev

B.T.Price, J.Nuclear Energy 2, 128 (1955).

U^{236} 92 144

Resonances	U^{235}(n,f)	$E_n = 10^{-3}$ to 200 ev	
	0.29	6.8	cryst
	1.1	9	
	3.4	14	

J.M.Auclair, M.Galula, P.Hubert, B.Jacrot, R.Joly, F.Netter, G.Vendryes, Geneva Conf. 8/P/354 (1955).

Resonances $U^{(235)}$(n,f) pulsed n's

σ_{fo}*	E_o(ev)	$\sigma_f\Gamma$	Γ_γ/Γ_f
1278	8.8	110	0.5
100	11.7	7.4	6
624	12.34	43.7	2
1479	19.3	103.5	1

*From $\sigma_f\Gamma/\sigma_t\Gamma$ and σ_{to}

M.L.Yeater, W.R.Mills, D.E.McMillan, E.R. Gaerttner, Bull. Am. Phys. Soc. 1, No. 1, 8, A5 (1956); verbal report.

Resonances U^{235}(n) chopper

E_o(ev)	$2g\Gamma_n^o$(mev)$	E_o(ev)	$2g\Gamma_n^o$(mev)$
9.25 5	0.054 16	25.9 4	0.076 24
9.70 5	0.022 6	26.8 4	0.16 4
10.13 5	0.017 6	28.0 4	0.13 2
10.40 5	0.004 8	28.6 4	0.066 20
10.80 5	0.006 12	29.9 5	0.048 20
11.6 1	0.171 15	31.1 5	0.20 3
12.4 1	0.396 23	32.3 5	0.41 10
12.8 1	0.014 4	33.8 5	0.35 7
13.3* 1	0.030 4	34.7 6	0.46 8
14.1* 1	0.092 11	35.3 6	0.90 17
14.7* 1	0.032 4	38.4 7	0.026 7
15.5* 1	0.054 3	39.7 7	0.40 10
16.2 1	0.087 5	42.0 7	0.35 10
16.8 2	0.055 5	43.7 8	0.145 46
18.2 2	0.079 3	44.8 8	0.27 7
19.5 2	0.63 4	47.1 8	0.184 42
20.3 2	0.008 3	48.6 9	0.750 16
21.2 2	0.28 6	51.6 9	6.4 15
23.2 3	0.13 2	55.4 10	0.39 8
23.7 3	0.31 2	56.4 10	1.15 23
24.5 3	0.13 2	58.3 10	0.50 12
25.6 3	0.12 3	61.0 11	0.15 8

U^{235}(n,f)

E_o(ev)	Γ_f(mev)$	E_o(ev)	Γ_f(mev)$
11.6 1	9 11	23.7 3	104 81
12.4 1	16 12	34.7 6	48 27
16.2 1	12 17	35.3 6	82 33
19.5 2	79 22		

*Double?

$Based on $\bar{\Gamma}_\gamma = 30$ mev. $\Gamma_n^o = \Gamma_n/[E_o(\text{in ev})]^{1/2}$.

O.D.Simpson, R.G.Fluharty, F.B.Simpson, R.M. Brugger, Phys. Rev. 100, 1249A (1955); verbal report.

U^{237} 92 145 6.75^d

β^-	26%	0.084	$U^{236}(n,\gamma)$ chem; sd
	74%	0.249	

Continued

U^{237} 92 145 6.75^d

$\gamma(Np^{237})$	0.026	0.165	sd ce
	0.033	0.193 ?	
	0.043	0.208	
	0.060	0.268	
	0.069 ?	0.330	
	0.101	0.370	
	0.124 ?	0.433	

S.A.Baranov, K.N.Shlyagin, Conf. Acad. Sci. USSR on Peaceful Use of Atomic Energy, Phys. Math. Sci. p. 251 July (1955); Consultants Bureau Trans. p. 183.

U^{238} 92 146

Level	$U^{(238)}(\alpha,\alpha'\gamma)$	$E_\alpha = 3.3$;	scin
γ	0.045 3	$\tau = 440^{\mu\mu s}$	(α = 700)

A.S.Divatia, R.H.Davis, R.D.Moffat, D.A.Lind, Phys. Rev. 100, 1266A (1955); verbal report.

Level	U^{238}(n,n')	$E_n = 2.45$
	1.18 8	pulsed n's

L.Cranberg, J.S.Levin, Bull. Am. Phys. Soc. 1, No. 1, 56, R10 (1956); verbal report.

Np^{234} 93 141 4.4^d

$\gamma(U^{234})$	0.043	$L_2/L_3 = 1.4$	sl ce, scin
	0.099 ?		
	0.109	0.740*	
	0.151	0.752	
	0.234	0.780*	
	0.247	0.810	
	0.449	0.940*	
	0.486	1.010*	
	0.502*	1.200*	
	0.516	1.565	

(0.502 γ)(0.449, 0.740, 1.010 γ) scin

(0.740 γ)(0.449, 0.780 γ)

(0.940 γ)(0.502, 0.585 γ) *scin only

J.R.Huizenga, D.W.Engelkemeir, M.S.Freedman, F.T.Porter, J.T.Gindler, Bull. Am. Phys. Soc. 1, No. 4, 171 E7 (1956); verbal report.

Np^{237} 93 144 2.2×10^{6y}

α	0.02%	4.52	33%	4.767	ic
	0.5%	4.589	49%	4.787	
	6.0%	4.644	3%	4.816	
	3%	4.674	3%	4.872	
	2%	4.713			

$\gamma(Pa^{233})$ scin, pc, s ce

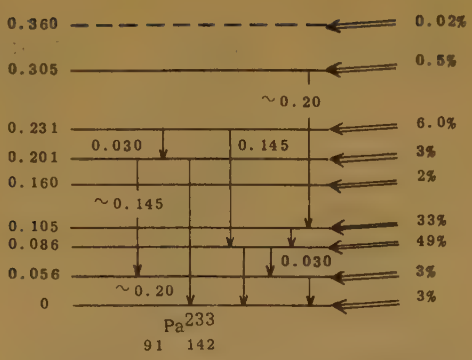
	<3†	0.020	$\alpha > 10$
	16†	0.029	$\alpha_L = 2.8$
	<1†	0.0568	$\alpha_L > 44$
	16†	0.0869	$\alpha_L = 0.75$
	1†	0.145	$\alpha_L = 0.15$
	0.1†	0.175	
	0.3†	0.200	
x(Pa)	130†	L x ray	
	5†	K x ray	

†Photons per 100 α's

Level scheme supported by αγ, γγ, α(ce)

Continued

Np^{237} 93 144 2.2×10^{6y}



L.B.Magnusson, D.W.Engelkemeir, M.S.Freedman, F.T.Porter, F.Wagner, Jr., Phys. Rev. 100, 1237A (1955); verbal report.

α's emitted preferentially in the direction perpendicular to nuclear axis $\alpha(\theta, T)$
$W(\theta) = 1 - 0.07\,P_2(\cos\theta)$ at 1.1°K

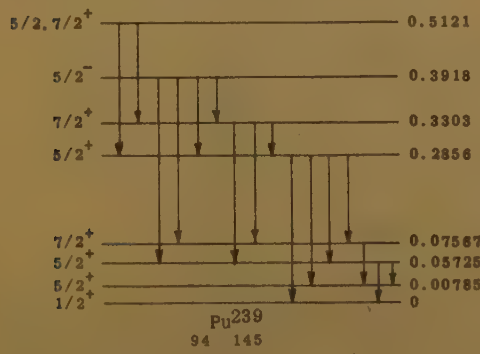
L.D.Roberts, J.W.T.Dabbs, G.W.Parker, R.D. Ellison, Bull. Am. Phys. Soc. 1, No. 4, 207 R8 (1956).

Np^{239} 93 146 2.3^d

$\gamma(Pu^{239})$ — U^{238}(pile n,$\gamma\beta$) chem; $s\pi$ ce

~300*	0.04464	M1/E2 = 4
475*	0.04940	M1/E2 = 2.4
1275*	0.05725	M1/E2 < 0.05
~10*	0.0614	E1 (ce_{L1} only)
800*	0.06782	E2
	0.09832	
	0.1033	
500*	0.10610	E1
	0.1064	
	0.1253	
	0.1818	
700*	0.2099	M1/E2 2.4
	0.2264	
1980*	0.2284	M1/E2 > 4
	0.2546	
	0.2731	
1400*	0.2777	M1/E2 > 9
	0.2856	
	0.3161	
	0.3345	

Multipole mixtures from $L_1 : L_2 : L_3$
*Relative ce intensity (assuming L/MN = 3)



J.M.Hollander, W.G.Smith, J.W.Mihelich, Phys. Rev. 100, 1238A (1955); verbal report.

Np^{239} 93 146 2.3^d

$\gamma(Pu^{239})$ — $U^{(238)}$(n,$\gamma\beta$) chem; 4π ic, scin

16† 0.44
19† 0.49
†Photons per 10^5 β's

H.W.Lefevre, E.M.Kinderman, H.H.Van Tuyl, Phys. Rev. 100, 1374 (1955).

Np^{240} 93 147 1^h g.s.

$\gamma(Pu^{240})$ — Np^{239}(n,γ) chem; scin

72† 0.88
100† 0.97
9† 1.14

H.W.Lefevre, E.M.Kinderman, H.H.Van Tuyl, Bull. Am. Phys. Soc. 1, No. 1, 62 UA6 (1956); verbal report.

Np^{240} 93 147 7.3^m

Not p $1^h Np^{240}$ (< 5%)

H.W.Lefevre, E.M.Kinderman, H.H. Van Tuyl, Bull. Am. Phys. Soc. 1, No. 1, 62 UA6 (1956).

Pu^{238} 94 144 90^y

α — sd
31% 5.4499 7
69% 5.4909 5

L.L.Gol'din, E.F.Tret'yakov, G.I.Novikova, Conf. Acad. Sci. USSR on Peaceful Use of Atomic Energy, Phys. Math. Sci. p. 226 July (1955); UCRL Trans. 242.

Pu^{239}? 94 145

155 tracks (range 100 to 300μ) observed in ppl from Pu^{239} source. Similiar tracks seen with active deposit of Po, Ac, and Th

M.Ader, Compt. rend. 241, 1748 (1955).

Pu^{239} 94 145

ground state
J 1/2 S

L.A.Korostyleva, A.R.Striganov, N.M.Iashin, Zhur. Ekspt'l i Teoret. Fiz. 28, 471 (1955); Soviet Phys. JETP 1, 310 (1955); Izvest. Akad. Nauk Ser. Fiz. SSSR 19, 31 (1955).

N.I.Kaliteevskii, M.P.Chaika, Doklady Akad. Nauk SSSR 103, 49 (1955).

Pu^{239} 94 145 2.4×10^{4y}

α — sd
10.7% 5.0963 3
16.8% 5.1344 3
72.5% 5.1474 2

$\gamma(U^{235})$* — sd ce
0.0125
0.0383
0.0508

No other α's from 4.9 to 5.33 (< 0.2%)

L.L.Gol'din, E.F.Tret'yakov, G.I.Novikova, Conf. Acad. Sci. USSR on Peaceful Use of Atomic Energy, Phys. Math. Sci. p. 226 July (1955); UCRL Trans. 242. *K.N.Shlyagin, ibid.

Pu^{240}
94 146
6580^y

τ 6580^y *130* Pu^{239}(pile n,γ) specific activity

J.P.Butler, T.A.Eastwood, T.L.Collins, M.E. Jones, F.M.Rourke, R.P.Schuman, Bull. Am. Phys. Soc. 1, No. 4, 187 K4 (1956).

α	24.5%	**5.1147** *5*	sd
	75.5%	**5.1589** *3*	
$\gamma(U^{236})^*$		**0.0446**	sd ce

No other α (< 0.6%)

L.L.Gol'din, E.F.Tret'yakov, G.I.Novikova, Conf. Acad. Sci. USSR on Peaceful Use of Atomic Energy, Phys. Math. Sci. p. 226 July (1955); UCRL Trans. 242. *K.N.Shlyagin, ibid.

Pu^{240}
94 146

Resonances Pu^{239}(n) E_n = 0.03 to 20 ev
0.297 ev **11.5** chopper
8 **15**

Pu^{239}(n,f) $E_n = 10^{-3}$ to 100 ev
0.297 *3* Γ = 0.09 *1* cryst
σ_o = 3000

J.M.Auclair, M.Galula, P.Hubert, B.Jacrot, R.Joly, F.Netter, G.Vendryes, Geneva Conf. 8/P/354 (1955).

Resonance Pu^{239}(n) cryst
0.300 *5* ev Γ = 105 *5* mev
σ_o = 4600 *300*

N.Galanina, K.Ignatyev, S.Nikitin, S. Sukhoruchkin, quoted by Yu.G.Abov, Conf. Acad. Sci. USSR on Peaceful Use of Atomic Energy, Phys. Math. Sci. p. 249 July (1955); Consultants Bureau Trans. p. 209.

Resonances Pu^{239}(n,f) E_n = 0.007 to 700 ev
0.297 ev Γ = 98 *3* mev cryst,
σ_o = 2940 *100* chopper

E_o(ev)	σ_o^*	E_o(ev)	σ_o^*
8.0 *2*	840	**18.3** *5*	750
11.2 *3*	1930	**22.8** *7*	1030
15.1 *4*	1530	**26.8** *9*	490

*Assuming Γ = 100 mev

R.Richmond, B.T.Price, J. Nuclear Energy 2, 177 (1956).

Resonances Pu^{239}(n,f)

0.3 ev	
7.8	**17.6**
11.0	**22.2**
11.9	**42**
14.3	**44.5**
14.7	**50**
15.3	**53**

R.E.Coté, L.M.Bollinger, J.M.LeBlanc, G.E. Thomas, Bull. Am. Phys. Soc. 1, No. 4, 187 K5 (1956).

Pu^{241}
94 147

Resonance $Pu^{(240)}$(n) cryst
1.075 *5* ev Γ = 42 *5* mev
Γ_n = 6.2 *9* mev
$\sigma_o = 1.78 \times 10^5$ *16*

Yu.G.Abov, Conf. Acad. Sci. USSR on Peaceful Use of Atomic Energy, Phys. Math. Sci. p. 249 July (1955); Consultants Bureau Trans. p. 209.

Pu^{242}
94 148
3.8×10^{5y}

τ **3.79 x** $\mathbf{10^{5y}}$ *7* Pu(pile n) specific activity

J.P.Butler, T.A.Eastwood, T.L.Collins, M.E. Jones, F.M.Rourke, R.P.Schuman, Bull. Am. Phys. Soc. 1, No. 4, 187 K4 (1956).

Pu^{242}
94 148

Resonances Pu^{241}(n,f) E_n = 0.01 to 9 ev
0.255 *20* Γ = 103 *20* mev cryst,
σ_o = 1420 *150* chopper
4.45 *10* Γ = 470 mev (double?)
5 to 7.5 3 resonances

R.Richmond, B.T.Price, J. Nuclear Energy 2, 177 (1956).

Pu^{244}
94 150
8×10^{7y}

τ $\mathbf{7.6 \times 10^{7y}}$ *20* Pu(pile n) chem;ms counted $7.3^m Np^{240}$

H.Diamond, R.Barnes, Phys. Rev. 101, 1064 (1956).

τ $\sim 8 \times 10^{7y}$ Pu(pile n) chem;ms counted $14^h U^{240}$

J.P.Butler, T.A.Eastwood, T.L.Collins, M.E. Jones, F.M.Rourke, R.P.Schuman, Bull. Am. Phys. Soc. 1, No. 4, 187 K4 (1956).

τ for spontaneous fission = 2.5×10^{10y} *8*

P.R.Fields, J.E.Gindler, A.L.Harkness, M.H. Studier, J.R.Huizenga, A.M.Friedman, Phys. Rev. 100, 172 (1955).

Pu^{245}
94 151
10^h

τ $\mathbf{10.1^h}$ *5* Pu^{244}(pile n,γ) p $25^m Am$ chem

P.R.Fields, M.H.Studier, A.M.Friedman, H. Diamond, R.Sjoblom, P.A.Sellers, J. Inorg. Nucl. Chem. 1, 262 (1955).

τ $\mathbf{12^h}$ *1* Pu^{239}(pile n) chem

C.I.Browne, D.C.Hoffman, W.T.Crane, J.P. Balagna, G.H.Higgins, J.W.Barnes, R.W.Hoff, H.L.Smith, J.P.Mize, M.E.Bunker, J. Inorg. Nucl. Chem. 1, 254 (1955).

Pu^{246} 94 152 11^d

τ	11.2^d *2*	H-bomb debris, chem; ms		
β^-	0.15			a
$\gamma(Am^{246})$	0.043		0.175	scin
	0.111 *3*		0.224 *10*	

p 25^mAm chem

D. Engelkemeir, P. R. Fields, S. Fried, G. L. Pyle, C. M. Stevens, L. B. Asprey, C. I. Browne, H. L. Smith, R. W. Spence, J. Inorg. Nuclear Chem. 1, 345 (1955).

Am^{239} 95 144 12^h

α	0.003%*		Pu^{239}(18-Mev d, 2n)	
$\gamma(Np^{235})$ 5†	0.0483 *15*	E1		pc

$\alpha(0.048\gamma)$

†Photons per 10 α's

F. Asaro, F. S. Stephens, Jr., W. M. Gibson, R. A. Glass, I. Perlman, Phys. Rev. 100, 1541 (1955); *G. H. Higgins, ibid.

Am^{241} 95 146 470^y

α	0.002%	5.241 *5* ?	sd
	0.015%	5.321 *3*	
	1.66%	5.3860 *5*	
	18.8%	5.4391 *6*	
	85%	5.4820 *6*	
	0.24%	5.5082 *5*	
	0.39%	5.5408 *6*	

L. L. Gol'din, E. F. Tret'yakov, G. I. Novikova, Conf. Acad. Sci. USSR on Peaceful Use of Atomic Energy, Phys. Math. Sci. p. 226 July (1955); UCRL Trans. 242.

$\gamma(Np^{237})$ d Pu^{241}; sd ce

		L_1	L_2	L_3	
85*	0.02638	9	20	13	E1
119*	0.03322	51	12	12	M1 + (E2?)
137*	0.04343	40	33	26	E2 + M1
10*	0.05552	4	3		
350*	0.05962	73	155	33	E2/M1 = 9
	0.09880				

*Relative ce intensities

S. A. Baranov, K. N. Shlyagin, Conf. Acad. Sci. USSR on Peaceful Use of Atomic Energy, Phys. Math. Sci. p. 251 July (1955); Consultants Bureau Trans. p. 183.

$\gamma(Np^{237})$ scin

	27†	(0.0264)	370†	(0.0596)
	~0.6†	(0.0434)	0.2†	(0.0988)
x	370†	L x ray		

†Photons per 10^3 α's

L. B. Magnusson, D. W. Engelkemeir, Bull. Am. Phys. Soc. 1, No. 4, 171 E8 (1956); verbal report.

Am^{242} 95 147 100^y g. s.

β^-	90%	0.585 *10*	Am^{241}(n,γ) chem; sd
ϵ_K	10%		scin Pu K x ray

No ce observed sd ce

45 ± 10% of β's to 0.042 Cm^{242} level from β(L x ray)/β

R. W. Hoff, H. Jaffe, T. O. Passell, F. S. Stephens E. K. Hulet, S. G. Thompson, Phys. Rev. 100, 1403 (1955).

Am^{242} 95 147 16^h

τ		16^h	Am^{241}(n,γ) chem
β^-	~49%	0.625 *5*	ΔJ = 2, yes shape sd
	~33%	0.667 *5*	F-K assumed linear
ϵ	(~18%)		pc Pu K_α, K_β x rays

		L_2	L_3	M	N	
$\gamma(Cm^{242})$						sd ce
559*	0.0422	222	163	120	54	E2
$\gamma(Am^{242})$						
< 50*	0.0451					
$\gamma(Pu^{242})$						
128*	0.0445	69	34	18	7	E2

*ce per 1000 β^-

S. A. Baranov, K. N. Shlyagin, Conf. Acad. Sci. USSR on Peaceful Use of Atomic Energy, Phys. Math. Sci. p. 251 July (1955); Consultants Bureau Trans. p. 183.

β^-	81%$	0.620 *10*		Am^{241}(n,γ) chem; sd
ϵ	19%$			Pu^{242}/Cm^{242}
$\gamma(Cm^{242})$				sd ce
100*	0.0422 *3***	L_2/L_3 = 1.4 *4*		E2
$\gamma(Pu^{242})$				
40*	0.0446 *3***	L_2/L_3 = 1.4 *4*		E2

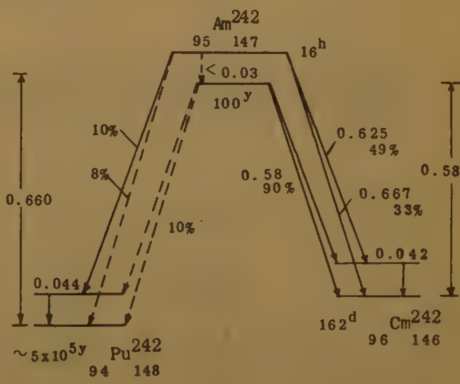
No IT (<6% from L x ray intensities) cryst

No IT γ with E_γ > 0.030 sd ce

51 ± 5% of β's to 0.042 Cm^{242} level from β(L x ray)/β

*Relative ce_L intensities

R. W. Hoff, H. Jaffe, T. O. Passell, F. S. Stephens, E. K. Hulet, S. G. Thompson, Phys. Rev. 100, 1403 (1955); $G. H. Higgins, S. G. Thompson, ibid.; **E. L. Church, ibid.



Am^{244} 95 149 26^m

$\epsilon/\beta^- = 3.9 \times 10^{-4}$ Am^{243}(pile n,γ) chem; ms

From Pu^{244}, Cm^{244} yield

P. R. Fields, J. E. Gindler, A. L. Harkness, M. H. Studier, J. R. Huizenga, A. M. Friedman, Phys. Rev. 100, 172 (1955).

Am^{245} 95 150 2.0^h

τ	1.98^h *2*	d 2.0^hPu chem
β^-	~0.86	a
$\gamma(Cm^{245})$	0.121	scin
	0.260	

P. R. Fields, M. H. Studier, A. M. Friedman, H. Diamond, R. Sjoblom, P. A. Sellers, J. Inorg. Nucl. Chem. 1, 262 (1955).

Am^{245} 95 150 2.0^h

τ	2.08^h *8*	Pu^{239}(pile n) chem	
β^-	0.905 *5*		sl
$\gamma(Cm^{245})$	0.036 *5*	0.140 *5*	scin $\gamma\gamma$
	0.060 ?	0.153 *5*	
	0.078 ?	0.230 *5*	
	0.111^* *5*	$0.255^\$$ *5*	
	0.123 *5*		

$^\$\alpha_K = 0.19$ K/L = 5 E1 sl ce

$(0.255\,\gamma)(0.036, 0.06?, 0.078?, 0.11^*, 0.12, 0.15\,\gamma)$

$(0.230\,\gamma)(0.036, 0.06?, 0.078?, 0.11^*, 0.14\,\gamma)$

$(0.11^*\,\gamma)(0.11^*, 0.14, 0.230, 0.255\,\gamma)$ *K x ray?

C.I.Browne, D.C.Hoffman, W.T.Crane, J.P. Balagna, G.H.Higgins, J.W.Barnes, R.W.Hoff, H.L.Smith, J.P.Mize, M.E.Bunker, J. Inorg. Nucl. Chem. 1, 254 (1955).

Am^{246} 95 151 25^m

τ 25^m p$\sim3000^y$Cm chem

C.I.Browne, D.C.Hoffman, W.T.Crane, J.P. Balagna, G.H.Higgins, J.W.Barnes, R.W.Hoff, H.L.Smith, J.P.Mize, M.E.Bunker, J. Inorg. Nucl. Chem. 1, 254 (1955).

τ	25.0^m *2*	d 11^dPu chem
β^-	1.222	scin $\beta(1.069\,\gamma)$
w	>1.2	scin
$\gamma(Cm^{246})$	~0.10 (K x ray ?)	$(1.069\,\gamma)\,\gamma$
	~0.20	
	0.795	scin
	1.069	
x	L x ray	

$(1.069\,\gamma)(1.22\beta, \sim0.10, \sim0.20\,\gamma)$

$(\sim0.10\,\gamma)(1.069\,\gamma)/(\sim0.10\,\gamma) = 0.04$

D.Engelkemeir, P.R.Fields, S.Fried, G.L.Pyle, C.M.Stevens, L.B.Asprey, C.I.Browne, H.L. Smith, R.W.Spence, J.Inorg. Nuclear Chem. 1, 345 (1955).

Cm^{242} 96 146 162^d

$\gamma(Pu^{238})$	0.562	E1	scin
	0.605	E1	

E1 assignment from systematics

F.S.Stephens,Jr., F.Asaro, I.Perlman, Phys. Rev. 100, 1543 (1955).

Cm^{245} 96 149 1.4×10^{4y}

τ $1.43\text{x}10^{4y}$ *29* d 2.0^hAm chem

C.I.Browne, D.C.Hoffman, W.T.Crane, J.P. Balagna, G.H.Higgins, J.W.Barnes, R.W.Hoff, H.L.Smith, J.P.Mize, M.E.Bunker, J. Inorg. Chem. 1, 254 (1955).

Cm^{246} 96 150 $\sim3000^y$

τ 2300^y *460* d 25^mAm chem

C.I.Browne, D.C.Hoffman, W.T.Crane, J.P. Balagna, G.H.Higgins, J.W.Barnes, R.W.Hoff, H.L.Smith, J.P.Mize, M.E.Bunker, J. Inorg. Nucl. Chem. 1, 254 (1955).

Cf^{249} 98 151 $\sim470^y$

$\gamma(Cm^{245})$			d Bk^{249} chem
	16†	0.340	scin $\alpha\gamma$
	60†	0.395	

$\alpha(0.340, 0.395\,\gamma)$

†Photons per 100 α's

F.Asaro, F.S.Stephens, Jr., B.G.Harvey, I. Perlman, Phys. Rev. 100, 137 (1955).

Cf^{250} 98 152 10^y

α	17%	5.980	Cm^{244}(pile n); s
	83%	6.024 *5*	

F.Asaro, F.S.Stephens, Jr., B.G.Harvey, I. Perlman, Phys. Rev. 100, 137 (1955).

Cf^{251}? 98 153 $>18^d$

$\gamma(Cm^{247}?)$ 0.180 scin $\alpha\gamma$

F.Asaro, F.S.Stephens, Jr., B.G.Harvey, I. Perlman, Phys. Rev. 100, 137 (1955).

Cf^{252} 98 154 2.2^y

α	15.5%	6.069		Cm^{244}(pile n); s
	84.5%	6.112 *5*		
$\gamma(Cm^{248})$				scin $\alpha\gamma$
	14†	0.042	$\alpha = 1100$	E2
	13†	0.100		

$\alpha(0.042, 0.100\,\gamma)$

†Photons per 10^5 α's

F.Asaro, F.S.Stephens, Jr., B.G.Harvey, I. Perlman, Phys. Rev. 100, 137 (1955).

2. NEUTRON CROSS SECTIONS

Absorption cross sections for neutron energies marked "th" (thermal) have been determined, from measurements in a thermal neutron flux, in terms of the cross section value of a "standard" for neutrons of velocity 2200 m/sec, or energy ~0.025 ev. The standard used, when clearly stated by the experimenter, is given just after the reference and is generally one known to have a thermal absorption cross section with 1/v energy dependence. If the nucleus whose cross section is being measured also has a cross section with 1/v dependence, the cross section found for it by comparison with the standard will, of course, be a cross section for 2200 m/sec. If not, and the dependence often is not known, the value found by the comparison is $\overline{\sigma v}/2200$.

Cross sections for inelastic scattering are given in a way which indicates the experimental method used. For instance, "n, 2.00n′ (90°)" in the "Type of σ" column, means that the cross section given is for the production of 2.00-Mev neutrons at 90° to the incident beam (in barns per steradian) and that these neutrons were observed experimentally. The energy of the incoming neutrons is given in the column headed "Energy". If it is 2.45 Mev, the energy loss in the inelastic process was 0.45 Mev. If the σ type is shown as "n, n′ + 1.00γ (90°)" the cross section given is for the production of 1.00-Mev γ's. In this case γ's, not neutrons, were observed at 90°. The energy lost by the neutron is then 1.00 Mev or more depending on whether or not another γ ray, unobserved in the experiment, was in cascade with the 1.00-Mev γ.

Target	Energy	Type of σ	Value of σ or ∫σdΩ	Method	Ref.
H	380	t	0.034 *2*		55D46
	500	t	0.035 *2*		55D46
	590	t	0.036 *2*		55D46
	630	t	0.037 *4*		55D46
H^2	380	t	0.057 *2*		55D46
	500	t	0.065 *2*		55D46
	590	t	0.072 *2*		55D46
	630	t	0.077 *5*		55D46
Li^6	0.2 to 0.3	el(θ)	graphs	pc	56W04
Li^7	0.2 to 0.6	el(θ)	graphs	pc	56W04
Be	380	t	0.233 *4*		55D46
	500	t	0.249 *3*		55D46
	590	t	0.261 *4*		55D46
	630	t	0.274 *4*		55D46
Be^9	12.7	t-el	0.49 *8*	sphere	55T26
	14.1	t-el	0.37 *8*	sphere	55T26
$B^{(11)}$	2.59	n, n′ + 2.14γ(90°)	0.025	scin γ	56D01
B^{11}	12.5 to 19.9	n, αβ2α	table	ppl	55F20
C	12.7	t-el	0.56 *10*	sphere	55T26
	14.1	t-el	0.51 *8*	sphere	55T26
	380	t	0.286 *2*		55D46
	500	t	0.306 *2*		55D46
	590	t	0.319 *2*		55D46
	630	t	0.338 *5*		55D46
C^{12}	7.87	n, n′ + 4.43γ(90°)	0.060	scin γ	56H15
$N^{(14)}$	th	n, γ	0.060 *20*	sπ pr	56C04

Target	Energy	Type of σ	Value of σ or ∫σdΩ	Method	Ref.
O	380	t	0.376 *6*		55D46
	500	t	0.398 *4*		55D46
	590	t	0.407 *5*		55D46
	630	t	0.422 *9*		55D46
F^{19}	2.45	n, 1.10n′(90°)	0.024	pulsed VdG	56C05
	2.45	n, 0.88n′(90°)	0.024	pulsed VdG	56C05
	3.1 to 8.0	n, α	graph	$7.4^{s}N$	55M86
	4.7 to 8.0	n, p	graph	$29^{s}O$	55M86
Na^{23}	2.45	n, 2.00n′(90°)	0.040	pulsed VdG	56C05
Mg	2.45	n, 1.07n′(90°)	0.025	pulsed VdG	56C05
Mg^{24}	0.085	t	60		56T01
$Mg^{(24)}$	12.5 to 17.5	n, p	graph	$15^{h}Na$	56C22
Al^{27}	2.45	n, 1.43n′(90°)	0.020	pulsed VdG	56C05
	3.7	n, n′ + 0.84γ(90°)	0.022	scin γ	55R38
	3.7	n, n′ + 1.02γ(90°)	0.041	scin γ	55R38
	3.7	n, n′ + 2.22γ(90°)	0.013	scin γ	55R38
	3.5 to 14.1	t-el	table	sphere	55T26
	14	p + d	0.13	ppl	56H01
	380	t	0.582 *8*		55D46
	500	t	0.612 *4*		55D46
	590	t	0.631 *9*		55D46
	630	t	0.645 *7*		55D46
Si	3.7	n, n′ + 1.78γ(90°)	0.064	scin γ	55R38
$Si^{(28)}$	12.5 to 17.5	n, p	graph	$2.3^{m}Al$	56C22
P^{31}	1.2	n, n′ + 0.4γ	<0.05	scin γ	56V02
	1.2	n, n′ + 0.9γ	<0.15	scin γ	56V02
	2.45	n, 1.20n′(90°)	0.052	pulsed VdG	56C05
S	14	el(θ)	graph	scin n	56E03

Neutron Cross Sections continued

Target	Energy	Type of σ	Value of σ or ∫σdΩ	Method	Ref.
$Cl^{(37)}$	12.5 to 17.5	n,p	graph	5.0^{m}S	56C22
A	0.07 ev	t	0.96		56H08
	0.07 ev	s	0.61		56H08
A^{36}	0.07 ev	t	75 *9*		56H08
A^{40}	0.07 ev	s	0.36		56H08
Ti	2.45	n,1.40n′(90°)	0.062	pulsed VdG	56C05
	3.5 to 14.1	t-el	table	sphere	55T26
V	2.45	n,1.53n′(90°)	0.017	pulsed VdG	56C05
	2.45	n,0.82n′(90°)	0.018	pulsed VdG	56C05
Cr	2.45	n,1.02n′(90°)	0.049	pulsed VdG	56C05
	3.5 to 14.1	t-el	table	sphere	55T26
	4.4	el(90°)	0.037 *7*	ppl	56W02
	4.4	t(90°)	0.066 *17*	ppl	56W02
Mn^{55}	175 to 10^4 ev	t	graph		55B115
	0.65	n,n′+0.13γ(90°)	0.59 *10*	scin γ	56V02
	1.2	n,n′+0.84γ(90°)	0.15 *6*	scin γ	56V02
	2.45	n,1.47n′(90°)	0.020	pulsed VdG	56C05
	2.45	n,1.16n′(90°)	0.011	pulsed VdG	56C05
	2.45	n,0.92n′(90°)	0.012	pulsed VdG	56C05
Fe	1.67	el/inel (45°)	=2.7 *2*	scin n	55B137
	1.67	el/inel (90°)	=0.7 *1*	scin n	55B137
	1.67	el/inel (135°)	=1.6 *2*	scin n	55B137
	3.5 to 14.1	t-el	table	sphere	55T26
	3.7	n,n′+0.84γ(90°)	0.135	scin γ	55R38
	3.7	n,n′+1.80γ(90°)	0.024	scin γ	55R38
	6.5	el(90°)	0.013 *3*	ppl	56W02
	6.5	t(90°)	0.061 *17*		56W02
	14	el(θ)	graph	scin n	56E03
$Fe^{(56)}$	0.8 to 1.8	n,n′+0.85γ(90°)	graph	scin γ	56V02
	2.45	n,1.60n′(90°)	0.085	pulsed VdG	55C50
Co^{59}	2.45	n,1.25n′(90°)	0.039	pulsed VdG	56C05
	2.45	n,0.94n′(90°)	0.035	pulsed VdG	56C05
	2.45	n,0.70n′(90°)	0.012	pulsed VdG	56C05
Ni	2.45	n,~1.0n′(90°)	0.052	pulsed VdG	56C05
	3.5 to 14.1	t-el	table	sphere	55T26
$Ni^{(58)}$	pile	n,p	0.030 *3*	72^{d}Co	56R01
$Ni^{(60)}$	pile	n,p	<0.6 *1* mb	5.2^{y}Co	56R01
Cu	2.45	n,1.48n′(90°)	0.015	pulsed VdG	56C05
	2.45	n,0.99n′(90°)	0.014	pulsed VdG	56C05
	2.45	n,0.83n′(90°)	0.006	pulsed VdG	56C05
	2.45	n,0.71n′(90°)	0.004	pulsed VdG	56C05
	2.45	n,0.55n′(90°)	0.006	pulsed VdG	56C05
	3.5 to 14.1	t-el	table	sphere	55T26
	380	t	1.17 *3*		55D46
	500	t	1.21 *2*		55D46
	590	t	1.25 *4*		55D46
	630	t	1.31 *3*		55D46
$Cu^{(63)}$	12.5 to 17.5	n,2n	graph	10^{m}Cu	56C22
Zn	2.45	n,1.01n′(90°)	0.059	pulsed VdG	56C05
$Zn^{(64)}$	12.5 to 17.5	n,2n	graph	38^{m}Zn	56C22

Neutron Cross Sections continued

Target	Energy	Type of σ	Value of σ or ∫σdΩ	Method	Ref.
$Zn^{(68)}$	14	n,α	0.0076 *8*	2.6^{h}Ni	55B136
As^{75}	2.45	n,1.64n′(90°)	0.030	pulsed VdG	56C05
Se	1 to 10^3 ev	t	graph		55B115
	2.45	n,1.81n′(90°)	0.064	pulsed VdG	56C05
	2.45	n,0.95n′(90°)	0.043	pulsed VdG	56C05
$Sr^{(88)}$	12.5 to 17.5	n,p	graph	18^{m}Rb	56C22
Y^{89}	0.8 to 1.8	n,n′+0.91γ	graph	scin γ	55S92
Y^{90}	th	n,γ	<6.5	57^{d}Y	55S96
Zr	0.7 to 1.2	t	graph		56G05
	0.9 to 2.2	n,n′+0.93γ	graph	scin γ	56G05
	2.45	n,1.51n′(90°)	0.23	pulsed VdG	56C05
	2.56	n,n′+2.17γ(90°)	0.22	scin γ	56D01
	2.56	n,n′+0.92γ(90°)	0.05	scin γ	56D01
$Zr^{(90)}$	14	n,α	0.0033 *6*	2.8^{h}Sr	55B136
$Zr^{(94)}$	14	n,α	0.0036 *5*	9.7^{h}Sr	55B136
Mo	2.45	n,1.62n′(90°)	0.042	pulsed VdG	56C05
	2.45	n,0.89n′(90°)	0.052	pulsed VdG	56C05
	4.4	el(90°)	0.036 *9*	ppl	56W02
	4.4	t(90°)	0.076 *20*		56W02
Ag	3.5 to 14.1	t-el	table	sphere	55T26
Cd	2.45	n,1.81n′(90°)	0.039	pulsed VdG	56C05
	2.45	n,1.09n′(90°)	0.030	pulsed VdG	56C05
	2.45	n,0.96n′(90°)	0.030	pulsed VdG	56C05
In	14	el(θ)	graph	scin n	56E03
$In^{(115)}$	14	n,α	0.0025 *4*	3.2^{h}Ag	55B136
Sn	2.45	n,1.21n′(90°)	0.047	pulsed VdG	56C05
	3.5 to 14.1	t-el	table	sphere	55T26
	13.5	t	4.70		55M92
	380	t	1.88 *4*		55D46
	500	t	1.93 *3*		55D46
	590	t	1.98 *4*		55D46
	630	t	2.03 *4*		55D46
Sb	3.7	n,n′+1.00γ(90°)	0.075	scin γ	55R38
Te	2.45	n,1.73n′(90°)	0.054	pulsed VdG	56C05
I^{127}	0.40	n,n′+0.062γ	0.30 *5*	scin γ	56V02
	0.65	n,n′+0.208γ	0.31 *8*	scin γ	56V02
	1.18	n,n′+0.435γ	0.44 *12*	scin γ	56V02
	1.18	n,n′+0.632γ	0.59 *10*	scin γ	56V02
$Ba^{(132)}$	pile	n,p	0.7 *2* mb	6.2^{d}Cs	56R01
$Ba^{(136)}$	pile	n,p	0.20 *5* mb	13^{d}Cs	56R01
Ba^{137}	0.5 to 3.0	n,n′+0.66γ	graph	scin γ	55S92
Ce^{136}	pile	n,γ	~20	8.7^{h}Ce	55B105
	pile	n,γ	~2	34.5^{h}Ce	55B105
Pr^{142}	th	n,γ	18 *3*	19^{h}Pr	55S96

Neutron Cross Sections continued

Target	Energy	Type of σ	Value of σ or $\int \sigma d\Omega$	Method	Ref.
Ta	14	el(θ)	graph	scin n	56E03
W	380	t	2.69 *4*		55D46
	500	t	2.73 *3*		55D46
	590	t	2.78 *6*		55D46
	630	t	2.82 *5*		55D46
Re	1.0 to 2.5ev	t	graphs		55I09
Ir	0.5 to 6.2	t	graphs		55L55
Au^{197}	0.0253 ev	a	99.3 *5*	1/v line	56H07
	0.0253 ev	a	99.0 *20*	1/v line	55G64
	14	n, >7p	~0.11	ppl	56P02
	14	n, ~13p	0.04	ppl	56P02
Hg	16.0	t	5.49		55M92
Hg^{199}	0.6 to 1.0	n,n′+44^{m}Hg	graph	scin γ	55S92
Pb	3.4	el(θ)	graph	scin n	55B110
	3.5 to 14.1	t-el	table	sphere	55T26
	380	t	2.81 *5*		55D46
	500	t	2.85 *3*		55D46
	590	t	2.92 *7*		55D46
	630	t	2.94 *7*		55D46
Pb^{206}	2.45	n,1.65n′(90°)	0.051	pulsed VdG	56C05
	2.45	n,1.01n′(90°)	0.044	pulsed VdG	56C05
	2.45	n,0.71n′(90°)	0.032	pulsed VdG	56C05
	2.56	n,n′+0.80γ(90°)	0.05	scin γ	56D01
	2.56	n,n′+0.54γ(90°)	0.03	scin γ	56D01
	2.56	n,n′+0.66γ(90°)	0.017	scin γ	56D01
	2.56	n,n′+1.68γ(90°)	0.01	scin γ	56D01
Bi	14	el(θ)	graph	scin n	56E03
Bi^{209}	2ev to 0.02	t	graph		55B115
	2.45	n,1.54n′(90°)	0.032	pulsed VdG	56C05
	2.45	n,0.85n′(90°)	0.036	pulsed VdG	56C05
	3.4	el(θ)	graph	scin n	55B110
	3.5 to 14.1	t-el	table	sphere	55T26
	15.8	t	5.75		55M92
Ra^{223}	th	n,γ	125 *15*	11^{h}Pb	55H71
U	0.3 to 1.2 ev	t	graph		55A51
	1.0 to 1.8	f	graph		55S100
	380	t	3.25 *6*		55D46
	500	t	3.27 *5*		55D46
	590	t	3.29 *7*		55D46
	630	t	3.30 *8*		55D46
U^{233}	0.002 to 1000ev	f	graph		55A51
	0.85	f	1.92 *25*		55S100
U^{234}	0.30 to 4.0	f	graph		55L50
U^{235}	0.004 to 200 ev	f	graph		55A51
	0.005 to 150 ev	f(rel)	graph		55P48
	0.03 to 0.05	a	2.8	sphere	56M07
	0.70 to 1.0	f	1.15 *15*		55S100
U^{236}	0.67 to 4.0	f	graph		55L50
Np^{237}	th	n,γ	172 *7*	90^{y}Pu	55B140
Np^{239}	pile	n,γ	17 +*17*,-*6*	1^{h}Np	56L01
	pile	n,γ	29 *6*	7.3^{m}Np	56L01

Neutron Cross Sections continued

Target	Energy	Type of σ	Value of σ or $\int \sigma d\Omega$	Method	Ref.
Pu^{238}	th	n,γ	454 *8*	ms	56B26
	pile	n,γ	484 *7*	ms	56B26
Pu^{239}	10^{-3} to 100 ev	f	graph		55A51
	0.007 to 700 ev	f(rel)	graph		56R12
	0.01 to 2 ev	t	graph		55G63
	0.0253 ev	t	1050 *13*		55A47
	0.03 to 0.05	a	2.2	sphere	56M07
	0.05 to 2.0	f	graph		55S100
Pu^{240}	0.0253 ev	a	400 *40*	ms	55H55
Pu^{241}	0.01 to 8 ev	f(rel)	graph		56R12
Pu^{242}	th	n,γ	22.9 *8*	$Am^{243}\alpha$	56B26
	pile	n,γ	50.6 *7*	$Am^{243}\alpha$	56B26
	pile	t	64 *15*	ms	56B26
Pu^{244}	pile	n,γ	1.4	25^{m}Am	55F37
Am^{243}	th	n,γ	81.6 *18*	$Cm^{244}\alpha$	56B26
	pile	n,γ	131.8 *17*	$Cm^{244}\alpha$	56B26

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3. GROUND STATE Q'S

Q values are defined by the conservation equation, $M_1 + M_2 = M_3 + M_4 + Q$ or $Q = E_3 + E_4 - E_1 - E_2$ where the M's are the rest masses and the E's the kinetic energies of the reacting particles. Ground state Q's are those measured when the product particles are left in their lowest energy states. If the most energetic emitted particle has escaped detection, the true ground state Q is greater than the value given.

The energy standard used, when clearly stated by the experimenter, is mentioned with the reference. Usually the energy measurement for only one particle, either the incident or emitted light particle, presents difficulties. It is the standard used for this particle that is given.

N. B. A uniform policy for denoting the use of enriched or monoisotopic material is now in use in all four New Nuclear Data tables. This policy is described in the section on Conventions just following the introduction. Briefly, parentheses around the A value indicate natural material, no parentheses enriched or monoisotopic material.

Reaction	Value		Source	Detector	Ref.
$Li^6(p,\gamma)Be^7$	5.66	5	VdG	scin	56W03
$Li^{(7)}(d,p)Li^{(8)}$	-0.183	20		s	55K41
$Li^{(7)}(d,\alpha)He^{(5)}$	13.719	20		s	55K41
$Li^7(\alpha,n)B^{10}$	-2.82	10	cyc	BF_3 pc	56R06
$Li^{(7)}(\alpha,n)B^{(10)}$	-2.79		VdG	thresh n	56B23
$Be^8 \rightarrow 2He^4$	0.091		B^{12}	s	56F10
$B^{10}(\alpha,p)C^{13}$	4.08	3	cyc	scin	56P06
$B^{10}(\alpha,d)C^{12}$	1.341	2	VdG	EA	55C45
$B^{10}(\alpha,d)C^{12}$	1.36	9	cyc	scin	56P06
$B^{(11)}(\alpha,n)N^{(14)}$	0.0	3	cyc	p recoil	56Q01

Reaction	Value		Source	Detector	Ref.
$C^{(12)}(He^3,n)O^{(14)}$	1.148	4	VdG	BF_3	56B22
$C^{(12)}(He^3,n)O^{(14)}$	1.148	3	VdG		56B37
$C^{(12)}(He^3,p)N^{(14)}$	4.77		VdG	ppl	56J02
$C^{14}(d,p)C^{15}$	-1.007	1	VdG	EA	55D34
$C^{14}(d,\alpha)B^{12}$	0.362	2	VdG	EA	55D34
$N^{(14)}(n,\gamma)N^{(15)}$	10.833	8	pile	$s\pi$ pr	56C04
$N^{(14)}(d,n)O^{(15)}$	5.21	7	VdG	ppl	56N04
$O^{(16)}(d,n)F^{(17)}$	-1.626	4	VdG	thresh n	55M85
$F^{19}(n,\gamma)F^{20}$	6.599	11	pile	$s\pi$ pr	56C04

Ground State Q's continued

Reaction	Value		Source	Detector	Ref.
$F^{19}(n,d)O^{18}$	-5.79	8	(d, t)	pc	55R40
$F^{19}(p,n)Ne^{19}$	-4.022	5	VdG	thresh n	55M84
$F^{19}(t,\alpha)O^{18}$	11.847		VdG	sd	56J01
$F^{19}(\alpha,n)Na^{22}$	-2.0	2	cyc	p recoil	56Q01
$Mg^{(25)}(n,\gamma)Mg^{(26)}$	11.086	25	pile	sπ pr	56C04
$Al^{27}(p,n)Si^{27}$	-5.607	8	VdG	thresh n	55M84
$Si^{(28)}(d,p)Si^{(29)}$	6.229	40		s	54K47
$P^{31}(p,\alpha)Si^{28}$	1.911	5	VdG	sd	56V01
$P^{31}(\alpha,n)Cl^{34}$	-5.7	2	cyc	thresh n	56Q01
$Cl^{(35)}(p,\alpha)S^{(32)}$	1.851	7	VdG	sd	56V01
$Cl^{(35)}(p,\alpha)S^{(32)}$	1.865	15	VdG	sπ	55A50
$Cl^{35}(p,\alpha)S^{32}$	1.865	8	VdG	s	56E06
$Cl^{(35)}(d,p)Cl^{(36)}$	6.354	8	VdG	s	55P46
$Cl^{(35)}(d,\alpha)S^{(33)}$	8.277	10	VdG	s	55P46
$Cl^{(37)}(p,\alpha)S^{(34)}$	3.015	15	VdG	sπ	55A50
$Cl^{(37)}(p,\alpha)S^{(34)}$	3.015	11	VdG	sd	56V01
$Cl^{37}(p,\alpha)S^{34}$	3.026	8	VdG	s	56E06
$Cl^{(37)}(d,p)Cl^{(38)}$	3.877	8	VdG	s	55P46
$Cl^{(37)}(d,\alpha)S^{(35)}$	7.783	12	VdG	s	55P46
$K^{(39)}(p,\alpha)A^{(36)}$	1.267	20	VdG	sπ	55A50
$K^{(41)}(p,\alpha)A^{(38)}$	4.002	15	VdG	sπ	55A50
$Sc^{45}(p,n)Ti^{45}$	-2.844	4	VdG	thresh n	55B116
$V^{(51)}(p,n)Cr^{(51)}$	-1.5355	15	VdG	BF_3	55G54
$V^{(51)}(p,n)Cr^{(51)}$	-1.535		VdG	n res	55M81
$V^{(51)}(p,\alpha)Ti^{(48)}$	1.161	10	VdG	s	55B127
$Mn^{55}(p,n)Fe^{55}$	-1.015	3	VdG	thresh n	56J12
$Fe^{54}(d,p)Fe^{55}$	7.073		VdG	s	56S31
$Fe^{(56)}(d,p)Fe^{(57)}$	5.418		VdG	s	56S31
$Fe^{57}(d,p)Fe^{58}$	7.808		VdG	s	56S31
$Fe^{58}(d,p)Fe^{59}$	4.350		VdG	s	56S31
$Ni^{58}(p,\gamma)Cu^{59}$	3.43	2	VdG	scin	56G03
$Ni^{60}(p,\gamma)Cu^{61}$	4.88		VdG	scin	56G03
$Cu^{(63)}(\gamma,n)Cu^{(62)}$	-10.80	5	βtron	10^mCu	56B47
$Cu^{63}(p,n)Zn^{63}$	-4.149	4	VdG	thresh n	55B116
$Cu^{(65)}(\gamma,n)Cu^{(64)}$	-9.91	11	βtron	13^hCu	56B47
$Cu^{65}(p,n)Zn^{65}$	-2.136	4	VdG	thresh n	55B116
$Cu^{65}(p,n)Zn^{65}$	-2.131	5	VdG	n res	55M81
$Zn^{(68)}(p,n)Ga^{(68)}$	-3.694	6	VdG	thresh n	55B116
$Sr^{86}(\gamma,n)Sr^{85}$	-11.5		βtron	BF_3	55Y08

Ground State Q's continued

Reaction	Value		Source	Detector	Ref.
$Zr^{(90)}(\gamma,n)Zr^{(89)}$	-11.78	9	βtron	4^mZr	55F38
$Ag^{(107)}(\gamma,n)Ag^{(106)}$	-9.46	5	βtron	24^mAg	56B47
$Ag^{(109)}(\gamma,n)Ag^{(108)}$	-9.18	5	βtron	2.3^mAg	56B47
$Ba^{(138)}(d,p)Ba^{(139)}$	2.493	10	VdG	s	55P46
$Sm^{(149)}(n,\gamma)Sm^{(150)}$	8.00	3	pile	sπ Cp	55A46
$Hg^{(199)}(n,\gamma)Hg^{(200)}$	8.03	3	pile	sπ Cp	55A46
$Bi^{209}(p,2n)Po^{208}$	-9.65	8	cyc	α Po^{208}	56A05

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4. MASS DIFFERENCES AND RATIOS

Where no superscripts have been used with H, C, and O, the weights of the most abundant isotopes, namely 1, 12 and 16 respectively, are to be understood. Differences are given in millimass units.

	Value		Ref.
$C_4H_8O_2 - C_4H_7O_2$	+1008.16	2	56S45
$N^{14}H^2H - N^{14}H_3$	-1.5478	4	56Q02
$H^2O - H_2O$	-1.5476	5	56Q02
$H^2_2O - H_2O^{18}$	+8.3102	4	56Q02, 56S45
$HH^2O - F^{19}$	+18.4380	14	56S45
$H^2_2O - HF^{19}$	+16.8944	5	56S45
$H^2_2O - Ne^{20}$	+30.6872	7	56Q02, 56S45
$HH^2O^{18} - Ne^{21}$	+27.2482	7	56S45
$2H^2_2O - A^{40}$	+83.8780	26	56Q02
$B^{10}F^{19}_2 - S^{32}O$	+42.7730	17	56S45
$B^{11}F^{19}_3 - C_4H_4O$	-21.7052	13	56S45
$CH_4 - O$	+36.3931	9	56Q02
$C_2H_4 - CO$	+36.3934	8	56Q02
$C_3H_8 - CO_2$	+72.7870	16	56Q02
$C^{13} - C$	+1003.680	20	56R03
$C^{13}H_4 - HO$	+31.943	11	56K14
	+31.9253	7	56S45
$N^{14} - CH_2$	-12.5803	4	56Q02, 56S45
$N^{14}H_2 - CH_4$	-12.5803	4	56Q02, 56S45
$N^{14}_2 - C_2H_4$	-25.1585	6	56Q02, 56S45
$N^{14}H_2 - O$	+23.8164	5	56Q02, 56S45

	Value		Ref.
$N^{14}H_3 - HO$	+23.833	8	56K14
	+23.8159	6	56Q02, 56S45
$N^{14}_2 - CO$	+11.2441	19	55O08
	+11.2353	7	56Q02
	+11.2355	6	56S45
$N^{15} - CH_3$	-23.3652	9	56S45
$N^{15}H_3 - H_2O$	+13.019	5	56K14
	+13.0234	4	56S45
$O^{17} - HO$	-3.6077	5	56S45
$H_2O^{17} - H_3O$	-3.601	6	56K14
$2O^{17}O - C_4H_2O$	-22.448	18	56K14
$O^{18} - O$	+2004.875	25	56R03
$O^{18} - H_2O$	-11.4033	21	56Q02, 56S45
$HO^{18} - H_3O$	-11.405	8	56K14
$H_2O^{18} - H^2_2O$	-8.3102	4	56Q02, 56S45
$2O^{18}O - C_4H_4O$	-38.080	26	56K14
	-38.0734	16	56Q02, 56S45
$H_2O^{18} - HF^{19}$	+8.582	2	56K14
$H_2O^{18} - Ne^{20}$	+22.392	5	56K14
	+22.3770	6	56Q02, 56S45
$HH^2O^{18} - Ne^{21}$	+27.2482	7	56S45
$CO^{18} - 2Na^{23}$	+14.5184	40	56S45

	Value		Ref.
$CF_3^{19} - C_5H_9$	-75.2462	*20*	56S45
$Si^{28}F_3^{19} - C_6H_{13}$	-129.625	*4*	56S45
$Si^{29}F_3^{19} - C_6H_{14}$	-137.889	*7*	56S45
$F^{19} - HH^2O$	-18.4380	*14*	56S45
$HF^{19} - H_2^2O$	-16.8944	*5*	56S45
$B^{11}F_3^{19} - C_4H_4O$	-21.7052	*13*	56S45
$Si^{30}F_3^{19} - C_4H_7O_2$	-75.6590	*36*	56S45
$HF^{19} - H_2O^{18}$	-8.582	*2*	56K14
$B^{10}F_2^{19} - S^{32}O$	+42.7730	*17*	56S45
$Ne^{20} - H_2^2O$	-30.6872	*7*	56Q02, 56S45
$Ne^{20} - H_2O^{18}$	-22.392	*5*	56K14
	-22.3770	*6*	56Q02, 56S45
$2Ne^{21} - C_2H_2O$	-22.858	*10*	56K14
$Ne^{21} - HH^2O^{18}$	-27.2482	*7*	56S45
$2Ne^{22} - CO_2$	-7.042	*24*	56K14
	-7.0614	*12*	56S45
$2Na^{23} - COO^{18}$	-14.5184	*40*	56S45
$Mg^{24} - C_2$	-14.9621	*11*	56S45
$Mg^{25} - C_2H$	-21.9944	*10*	56S45
$Mg^{26} - C_2H_2$	-33.0676	*10*	56S45
$Al^{27} - C_2H_3$	-41.9548	*23*	56S45
$Si^{28}F_3^{19} - C_6H_{13}$	-129.625	*4*	56S45
$Si^{29}F_3^{19} - C_6H_{14}$	-137.889	*7*	56S45
$Si^{30}F_3^{19} - C_4H_7O_2$	-75.6590	*36*	56S45
$S^{32}O - C_4$	-33.0269	*13*	56Q02
$S^{32} - O_2$	-17.7599	*9*	56Q02
	-17.756	*10*	56S26
$2H^2S^{32} - C_4H_4O$	-50.7852	*18*	56Q02
$S^{32}O - B^{10}F_2^{19}$	-42.7730	*17*	56S45
$S^{32}O_2 - Zn^{64}$	-32.7687	*32*	56Q02

	Value		Ref.
$S^{33} - HS^{32}$	-8.448	*25*	56S26
$H_2S^{34} - C_3$	-16.466	*10*	56S26
$S^{34} - H_2S^{32}$	-19.851	*10*	56S26
$A^{36} - C_3$	-32.4729	*20*	56Q02
$A^{36} - 2H_2O$	-53.5874	*12*	56Q02
$A^{40} - C_3H_4$	-68.9344	*13*	56Q02
$A^{40} - 2H_2^2O$	-83.8780	*26*	56Q02
$Zn^{64} - 2O_2$	-50.90	*30*	55K42
•	-50.5266	*52*	56Q02
$Zn^{64} - S^{32}O_2$	-32.7687	*32*	56Q02
$2Zn^{66} - Xe^{132}$	-51.22	*30*	55K42
$2Zn^{67} - Xe^{134}$	-50.50	*40*	55K42
$2Zn^{68} - Xe^{136}$	-54.40	*40*	55K42
$Xe^{132} - 2Zn^{66}$	+51.22	*30*	55K42
$Xe^{134} - 2Zn^{67}$	+50.50	*40*	55K42
$Xe^{136} - 2Zn^{68}$	+54.40	*40*	55K42

Secondary standards calculated from doublets of 56Q02

H^1	1.0081442	*2*	mass units
H^2	2.0147406	*6*	
C^{12}	12.0038167	*8*	
S^{32}	31.9822401	*9*	

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